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DISEASES CAUSED BY BACTERIA AND FUNGI

Weaver, J. K. & Middlebrook, G. (1960). **Experimental penicillin prophylaxis of staphylococcal infection in rabbits.**—Proc. Soc. exp. Biol., N.Y. 103, 108-111. [Authors' summary modified.] 2046

Wound infections with small inocula of staphylococci were regularly produced in rabbits. Prophylactic penicillin was effective in preventing such wound infections due to "penicillin-resistant" staphylococci when size of inoculum was small and when the infecting organisms were derived from environment containing no penicillin. Penicillin did not prevent wound infection due to small inocula of "penicillin-resistant" staphylococci which were derived from an environment containing penicillin.

Louria, D. B. & Rogers, D. E. (1960). **An analysis of the effects of penicillin on an experimental infection produced by penicillin-resistant staphylococci.**—J. Lab. clin. Med. 55, 165-181. [Authors' summary modified.] 2047

Large doses of penicillin 4 hours after infection reduced mortality after experimental infection of mice with penicillin-resistant staphylococci. Staphylococci were eradicated from the kidneys in a significant proportion of survivors. Smaller doses prolonged survival but did not reduce the mortality or eradicate the renal infection. A 24-hour delay in the initiation of therapy markedly diminished its beneficial effects.

In contrast, in infections produced by a penicillin-sensitive strain of staphylococci, even small amounts of penicillin prevented death and no staphylococci could be cultured from the kidneys of most survivors, regardless of when treatment was instituted.

Fesce, A. & Negretti, F. (1959). **Interazioni "in vivo" tra stafilococchi e streptococchi.**

I. Effetti patogeni delle associazioni fra "Staph. aureus" e streptococchi delle mastiti. [Mixed infections with staphylococci and streptococci. I. Staphylococcus aureus and mastitis streptococci in mice.]—Arch. Vet. Ital. 10, 489-500. [Summaries in English, French and German.] 2048

In mice the association of the β toxin-producing strain of *Staph. aureus* with *Str. agalactiae* or *uberis* or *dysgalactiae* (all of low virulence) was synergic. The lower the virulence of the streptococci, the greater the synergy. It occurred only with strains that produced β toxin; it was not caused by the CAMP factor.—T.E.G.R.

I. Negretti, F. (1959). Una nuova reazione per la diagnosi rapida di mastite bovina. [A rapid diagnostic test for bovine mastitis.]—Arch. Vet. Ital. 10, 399-411. [Summaries in English, French and German.] 2049

II. Leali, L. & Vallis, P. (1959). Valutazione comparativa fra la prova di Negretti e quella di California nella diagnosi rapida di mastite. [Comparative study of tests for the rapid diagnosis of mastitis.]—Ibid. 413-420. [Summaries in English, French and German.] 2050

I. The antiformin test, previously described [V.B. 29, 3698], gave better results than the Whiteside test—higher agreement with the cell count and higher sensitivity from a bacteriological and diagnostic point of view.

II. A comparative study was made of the antiformin test described by Negretti and the "California mastitis test" described by Schalm & Noorlander [V.B. 27, 288f]. Of 909 milk samples submitted to both tests 113 were not in agreement. Of these, 99 were positive to the Negretti test only and 14 to the California test only.—T.E.G.R.

Shimizu, K., Nakagawa, M. & Ono, T. (1959). **Bacteriological studies on streptococci from**

bovine udder. II. Distribution of *Str. agalactiae* in domestic animals and long-term observations on the udder which harboured the organism.—Jap. J. vet. Res. 7, 203-214. [In English.] 2051

Apart from occurring in the cow's udder, *Streptococcus agalactiae* was found in 1 of 105 samples of nasal mucus from slaughtered horses, 1 of 112 horses' tonsils and 2 of 101 pigs' tonsils.—R.M.

White, J. B., Derbyshire, J. B., Pattison, I. H. & Wilson, C. D. (1959). **Skin gangrene of the bovine udder.**—Vet. Rec. 71, 764-765 & 766. 2052

The disease, which has been observed in the Salisbury area over the last 20 years, has very little effect on the general health of the animal but it has to be dried off owing to the difficulty in milking. It affects newly-calved heifers with oedematous udders in autumn when grass is plentiful or when the heifers have been excessively fed before calving. It occurs sporadically but may recur on the same farm. Usually few animals in a herd are affected but in one herd 15 of 45 were involved and spread from animal to animal was suspected; the high incidence and cessation after segregation suggested the possibility of an infective agent. *Streptococcus pyogenes* was isolated from vesicle fluid but experimental transmission was not achieved. Clinical features, prognosis and treatment and pathology are discussed.—T.E.G.R.

Young, C. W., Legates, J. E. & Lecce, J. G. (1960). **Genetic and phenotypic relationships between clinical mastitis, laboratory criteria, and udder height.**—J. Dairy Sci. 43, 54-62. [Authors' summary modified.] 2053

Genetic aspects of resistance to mastitis were investigated in 682 lactations of 422 cows in 4 herds in which quantitative scores were determined for clinical mastitis, bacterial infection, and leucocyte count. Heritability and repeatability estimates were obtained, and phenotypic and genetic correlations between scores estimated. Correlations were also obtained between udder height and the scores for clinical mastitis, bacterial infection, and leucocyte count.

Heritability estimates for clinical mastitis obtained from the paternal sister correlation and daughter-dam regression were inconsistent. Repeatability for clinical mastitis was estimated at 0.31. Estimated genetic correlations from the two analyses were 0.29 and 0.23 for clinical mastitis with bacterial infection,

and 0.80 and 0.98 for clinical mastitis with leucocyte count. Udder height was negatively correlated with scores for clinical mastitis, bacterial infections and leucocyte count.

Cerne, I., Drăghici, C. & Bangău, S. (1959). Cercetări asupra streptococilor izolați în vaginită granuloasă a bovinelor. [**Streptococci isolated from cows with granular vaginitis.**]—Lucr. Inst. Pat. Igienă anim., București 9, 177-187. [In Roumanian. Summaries in French and Russian.] 2054

The haemolytic and biochemical properties of 40 strains of streptococci isolated from cows with granular vaginitis were studied. 21 belonged to Group D. Five of 7 strains caused granular vaginitis when inoculated on to the vestibular mucous membrane of cows.—M.G.G.

Farzaliev, I. A. (1959). [**Diplococcal infection in buffaloes.**]—Veterinariya, Moscow 36, No. 12 pp. 34-35. [In Russian.] 2055

In parts of Azerbaijan 35-43% of buffalo calves died at the age of 3 or rarely 6 months from a septicæmic disease characterized by fever, lameness and severe swelling of the hock joints. Haemolytic streptococci and *Str. pneumoniae* were isolated from affected calves and the milk and urine of buffalo cows. The disease responded to chlortetracycline therapy.—R.M.

Chadwick, P. (1959). **Rapid identification of *Bacillus anthracis* by microscopical observation of bacteriophage lysis.**—J. gen. Microbiol. 21, 631-634. [Author's summary modified.] 2056

When young growing filaments or microcolonies of *B. anthracis* were treated with specific bacteriophage, fragmentation of the filaments followed by complete disintegration of the microcolony were visible microscopically within 2-3 hours. Other *Bacillus* species were unaffected by the phage. This technique is a simple one for accelerating the identification of *B. anthracis*.

Vachev, B. (1959). **Accelerated reaction according to the Ascoli cold method.**—Bull. Off. int. Epiz. 51, 854-857. [In English.] [In French pp. 858-861. Summary in Spanish.] 2057

Good results were obtained in the Ascoli test for anthrax when the extraction time was reduced from 18-21 hours to 1 hour.

—T.E.G.R.

Brandenburg, H. (1960). Über die Verwendbarkeit von Mäusen in der Tuberkulose-Diag-

nostik. [Use of mice in the diagnosis of tuberculosis.]—Zbl. Bakt. I. (Orig.) 177, 72-94. [Summaries in English, French, Spanish and Russian.] 2058

Mice inoculated s/c with 10-100 virulent tubercle bacilli developed after about 3 weeks foci containing numerous organisms at the site of injection. 1/m injection of 0.3-0.4 mg. of cortisone per g. on the 9th day after infection stimulated their multiplication. Foci developed in the lungs after intranasal infections but less material could be given by this route.—M.G.G.

Lambelin, G., Ectors, F. & Maricz, M. (1959). Observations sur la valeur diagnostique de la tuberculation intra-dermique chez le bétail du Haut-Ituri. [Diagnostic value of the intradermal tuberculin test in cattle in the upper Ituri region.]—Ann. Méd. vét. 103, 505-521. 2059

The authors compared Old Tuberculin and P.P.D. tuberculin in single i/d tests on over 3,000 cattle in the Belgian Congo. In general 21% were positive or doubtful in 1957. 14% in 1958 and 6% in 1959. Examination of 300 cattle which died from various causes revealed TB. in only 3 in 1957. No lesions were found in 23 reactors; 4 of 313 negative cattle were tuberculous. Of 337 reactors tested 2-6 times, 266 reacted only once. Non-pathogenic acid-fast bacteria were isolated from 11 of 23 reactors and also from 75 of 313 negative cattle. Causes of non-specific reactions were discussed.—M.G.G.

Lesslie, I. W. (1960). Tuberculosis in attested herds caused by the human type tubercle bacillus.—Vet. Rec. 72, 218-224. [Author's summary modified.] 2060

TB. in cattle in 5 attested herds caused by the human type tubercle bacillus is described.

In all 5 herds the human type infection, as indicated by tuberculin tests as well as by P.M. findings, was mainly in the youngstock. There were either no macroscopic lesions or small lesions only in the respiratory or alimentary systems.

In all the herds there was a history of an infected person working with the cattle. No further reactors occurred in these herds after the removal of the human source of infection.

Drug sensitivity patterns were of value for identification of the strain of human type tubercle bacilli isolated from a calf and from the infected human contact in the one case tested.

All strains were typed by cultural and

biological tests. The growth and morphology of colonies of human type tubercle bacilli on primary culture from bovine tissues sometimes showed some of the characteristics of the bovine type. The virulence of these human strains was the same as for typical human strains.

Lazdinya, A. A. (1959). [Importance of bovine type bacilli in extra-pulmonary tuberculosis of human beings in Latvia.]—Trudy Inst. Mikrobiol. Akad. Nauk. Latv. SSR 10, 53-58. [In Russian.] 2061

Of 94 strains of tubercle bacillus isolated from man, 2 were of bovine type. One of the bovine strains was associated with bone and joint infection, the other with meningitis.

—R.M.

Høybråten, P. (1959). Tuberkulose tilfeller hos fugler. [Tuberculosis in wild birds in Norway.]—Nord. VetMed. 11, 780-786. [In Norwegian. Summaries in English and German.] 2062

An account of generalized infection in a buzzard. Other cases recorded at the Oslo veterinary institute were in pigeons, pheasants, guinea-fowl, virginia quails, capercaillie, and geese. From the cases subjected to cultural examination, avian type bacilli were isolated.

—R.M.

Keong Wun Lyang (1960). Studies on the interaction between host cell and parasite. I. Morphologic studies of lung tissue cultured in vitro. II. The reaction of pulmonary cells cultured in vitro to virulent tubercle bacilli.—Amer. Rev. respir. Dis. 81, 200-205 & 206-212. [Summaries in French and Spanish. Author's summary modified.] 2063

Three types of cells, macrophages, epithelial cells, and spindle cells, grown in cultures of embryonic lung tissue of the g. pig, were subjected to contact with virulent strains of tubercle bacilli, and the cell-bacilli relations were studied.

The macrophage had the strongest phagocytosis of the three. This cell also showed bacilli-disintegrating action, in the early stage of infection, but it was markedly injured by the intracellular bacilli.

The epithelial cell could ingest only few bacilli; but these few intracellular bacilli could multiply rapidly, forming characteristic cords. Despite this vigorous growth the cytopathic effect of the bacilli was least on the

epithelial cell. The spindle cell could sometimes ingest a few bacilli, but the bacilli could not form intracellular cords.

Anon. (1960). Concluso a Perugia un altro esperimento di chemioprophylassi della tubercolosi. [*Chemoprophylaxis in tuberculosis*].—*Progr. vet.*, Torino 15, 23-25. 2064

In a study on the effect of isoniazid on the resistance to TB., 4 calves were kept for 4 months in contact with a cow with "open" TB. Treatment with isoniazid (10 mg./kg./day) was started after the second month and continued for 2 months, when the source of infection was removed and treatment suspended for 2 months. Treatment was again resumed for 2 months followed by an interval of 1 month and a third course lasting 1 month. A second group of 4 calves was vaccinated with B.C.G. and kept under "open stable" conditions. After 5 months these animals and 3 controls were inoculated with virulent *M. tuberculosis*. The controls developed infection while the animals in the other 2 groups developed a slight granuloma at the site of inoculation. P.M. examination revealed generalized infection in the controls and slight macroscopic lesions in some of the others. The granuloma at the site of inoculation and the associated lymph nodes in the controls differed greatly from those in the other groups. It is concluded that B.C.G. confers effective immunity and isoniazid protects and stimulates resistance to infection.—T.E.G.R.

Hole, N. H. (1959). The complement fixation test and Johne's disease.—*Aust. vet. J.* 35, 502. 2065

Comparative figures of reactions to c.f. tests for Johne's disease in Victoria, New Zealand, and at Weybridge, quoted by Gorrie, are discussed.

It is considered that the apparent discrepancies are due to differences in technique and interpretation and that in each case the accuracy is 80-82%.—L. C. LLOYD.

I. McQueen, D. S. (1959). Johne's disease with particular reference to diagnosis. (a) Field aspects.—*Aust. vet. J.* 35, 47-52. 2066

II. Gorrie, C. J. R. (1959). Johne's disease with particular reference to diagnosis. (b) Laboratory aspects.—*Ibid.* 53-58. 2067

III. Clark, B. L. (1959). Johne's disease with particular reference to diagnosis. Opening of discussion.—*Ibid.* 58-62. 2068

I. McQueen discusses the characteristic features of Johne's disease in Victoria.

From 1951 to 1957 the incidence rose from 3 to 23 clinical cases a year, and a total of 61 cases occurred on 46 properties. 17 cases were in cattle under 4 years of age, and 10 in cattle over 6 years.

Symptoms shown were wasting, scouring, and failure of lactation. Ridges in the mucosa and thickening of the mucosa in the ileo-caecal valve region were the most constant P.M. findings.

Control is difficult because of the lack of an efficient diagnostic test. McQueen discusses the value of the intradermal and complement-fixation tests, faecal examination, and their difficulties.

II. Staining faecal smears by a modified Ziehl-Neelsen stain may be of diagnostic value in animals showing some scouring.

In the c. f. test the addition of 0.5% phenol to serum has no discernible effect on the reactions of negative sera, but in some proven cases when unpreserved serum has given a negative reaction, preserved serum has been positive.

Post-mortem diagnosis is discussed. Smears are taken from the ileo-caecal valve, ileum, caecum and colon. A positive diagnosis depends on finding typical Johne's bacilli in smears from at least one portion of the bowel, irrespective of the macroscopic appearance.

Efforts are still being made to improve the c. f. test.

Johne's disease is unknown in Australian sheep but the sera of many normal animals give positive reactions to the c. f. test.

III. Clark discusses Johne's disease in Tasmania where the incidence is low. On King Island the incidence is high, 24 out of 200 farms being infected. The clinical picture is similar to that described by McQueen, except that animals appear very nervous. C. considers the intradermal test to be of value only as a herd test. The c. f. test was the most efficient means of ante-mortem diagnosis.

—L. C. LLOYD.

Hole, N. H. & Maclay, M. H. (1959). Symposium on Johne's disease. I. The diagnosis of Johne's disease in cattle and the identification of *M. johni* infection.—*Vet. Rec.* 71, 1145-1149. 2069

Withers, F. W. (1959). II. Incidence of the disease.—*Ibid.* 1150-1153. 2070

Spears, H. N. (1959). III. Vaccination against Johne's disease: The results of a field trial experiment.—*Ibid.* 1154-1156. 2071

Rankin, J. D. (1959). IV. Experimental infec-

tion.—Ibid. 1157-1160. Discussion: pp. 1160-1167. [Authors' summaries modified.] 2072

I. A discussion on the relative merits of faeces examination, allergic tests and the complement-fixation test.

II. In surveys made by the Central Veterinary Laboratory and Milk Marketing Board the incidence in Jersey cows was 2.1%, in Guernsey cows 1.9% while in all other breeds it averaged 0.6%. Published work on isolation of Johne's bacillus from slaughtered cattle suggests that about 11% of apparently normal cattle may be carriers.

III. Vaccination has been practised on a limited scale in Gt. Britain since 1946, using the vaccine developed by Vallée & Rinjard which consists of living *M. johnei* suspended in oils. It appeared to confer a useful degree of protection in most herds. It sometimes provoked the formation of excessively large nodules at the site of inoculation.

IV. A discussion of recent literature included results of experiments on calves done by the Agricultural Research Council. Estimation of the lethal dose of *M. johnei* for calves was described and the role of heredity in determining susceptibility was discussed. In discussion on the papers, R. mentioned attempts at chemotherapy.—R.M.

Borodenok, A. I. (1959). [Pathogenesis of paratuberculosis in experimentally infected sheep.] — Veterinariya, Moscow 36, No. 12 pp. 17-21. [In Russian.] 2073

Five healthy sheep aged 4½ to 5½ years were given by mouth an emulsion prepared from mucous membranes of intestinal lesions of cows with Johne's disease. Ten daily doses each of 10 ml. of emulsion were given. The sheep were examined every second or third week for temperature reaction, Johne's bacilli in faeces and reaction to i/d avian tuberculin. Observations lasted 6 months. Reaction to tuberculin commenced between 55 and 113 days after infection. No fever was observed, and the bacteria were not isolated from faeces during the 6 months. Specific histological changes in intestine were found 3 months after infection. B. suggested two phases of infection; adaptation (spread of bacteria to epithelial cells), and formation of intracellular microcolonies.—R.M.

Sigurdsson, B. (1960). A killed vaccine against paratuberculosis (Johne's disease) in sheep. — Amer. J. vet. Res. 21, 54-67. [Author's summary modified.] 2074

An account of a field trial using a killed

vaccine against Johne's disease in sheep on 141 farms in districts having heavy incidence of the disease. Half of the lambs on each farm were vaccinated in autumn 1950 and 1951 (3,273 lambs), the remainder (3,184) being controls. All were closely followed to the end of 1956. In the 1950 group, vaccination reduced the annual mortality from Johne's disease from 11.9 to 0.8%. In the 1951 group, the mortality was reduced from 8.5 to 0.5%.

The vaccine is a suspension of heat-killed *Mycobacterium johnei* in light mineral oil. The dose is 1ml. containing 5 mg. of dried bacteria. Only one injection is given and it is administered subcutaneously.

About 450,000 sheep have been vaccinated with this vaccine during seven years. Excellent protection has been obtained.

Geurden, L. M. G., Devos, A. & van den Wyngaert, M. (1959). Recherches sur l'inhibition in vitro des mycobactéries. [Substances which inhibit mycobacteria in culture.] — Med. Veeartsenijsschool Ghent 3, 7-68. [Summaries in English, German, Spanish and Dutch.] 2075

A comparative study of the effect of various substances on non acid-fast bacteria was first made in order to establish which factors inhibited growth. In the case of acid-fast organisms it was observed that the active radicals retained their efficacy only when a penetrating factor (a cyclic group in the case of semicarbazides) was present. Tests with 112 commercial or synthetic compounds (in the same concentration and under identical conditions) on 15 different types of mycobacteria revealed that each type of organism behaved in a completely autonomous manner. Apart from its clinical importance, this fact constitutes a determining element in the identification of non-classical mycobacteria and the diseases caused by them.—T.E.G.R.

Orlandella, V. (1959). Ricerche sull'associazione ialuronidasi-siero anti *E. rhusiopathiae*. [Effect of hyaluronidase on swine erysipelas serum.] — Acta med. vet., Napoli 5, 135-144. 2076

Hyaluronidase did not enhance the action of swine erysipelas serum in mice.—T.E.G.R.

Nordland, O. S. (1959). Host-parasite relations in initiation of infection. I. Occurrence of listeriosis in Arctic mammals, with a note on its possible pathogenesis.—Canad. J. comp. Med. 23, 393-400. 2077

Nordland, O. S. (1960). **Host-parasite relations in initiation of infection. II. Hyperglycemia and stress in experimental infection with *L. monocytogenes*.**—*Ibid.* 24, 57-74. [Author's absts. modified.] 2078

I. A lemming colony maintained at Fort Churchill was examined for latent *Erysipelothrix monocytogenes* infection, but the organism was not isolated. Following transfer of the lemmings from Churchill to Kingston (Ontario) the organism was isolated. In speculation on the pathogenesis of listeriosis, the author suggests that deranged carbohydrate metabolism may be the trigger mechanism.

The isolation of *E. monocytogenes* from a seemingly ill Arctic fox is reported for the first time.

II. The effects of stimuli on the initiation of listeria infection were studied in lemmings, rabbits, hamsters, and g.pigs. Stress was simulated by injection of cortisone acetate, or by trauma, heat, or cold. The course of the infection was influenced in favour of the invading micro-organism by the stress agents used. Hyperglycaemia was present in the animals that developed the infection to overt disease. This suggests that hyperglycaemia may be the trigger mechanism.

Hahnefeld, H. & Hahnefeld, E. (1959). Untersuchungen zur Frage der peroralen Listeria-monocytogenes-Infektion bei Kaninchen mit besonderer Berücksichtigung der Gravidität. [Oral listeria infection in pregnant rabbits.]—*Arch. exp. VetMed.* 13, 897-943. 2079

Rabbit does infected orally during the 8th-12th day of pregnancy with 0.1 ml. of broth culture of 11 strains of *Erysipelothrix (Listeria) monocytogenes*, developed chronic metritis. Foetuses died, but the dams survived. Does, infected between the 14th-22nd day of pregnancy died of acute metritis. Infection on the 25th day caused abortion. Does infected the 27th or 29th day produced infected litters. Parturition was at full term. When does were infected the day before or immediately after parturition, nothing abnormal in either dams or offspring was noticed. Males and non-pregnant females were susceptible to repeated oral infection. Two died of septic pneumonia, none had metritis. The mortality in rabbits five weeks old was 66%, eight weeks old 33%, and 12 weeks old 16%. There was a characteristic increase in blood monocytes, even in rabbits with latent infection. Agglutinins were demonstrable in pregnant, non-pregnant and young rabbits. *E. monocytogenes* was present

in organs of apparently healthy animals 2-5 weeks, in one case 110 days, after infection. It was demonstrable in the uterus of four, the bile of two, lungs of one and small intestine of one of 12 convalescent pregnant does, and also from lungs of two and liver and bile of one of 18 non-pregnant rabbits. Two phases of infection were observed, the bacteraemic and the uterine phase. There were fewer organisms in urine and faeces than in placenta, uterus and foetuses.—E.G.

Hyslop, N. St. G. & Osborne, A. D. (1959). **Listeriosis: A potential danger to public health.**—*Vet. Rec.* 71, 1082-1091. Discussion: pp. 1091-1095. [Authors' summary modified.] 2080

Symptoms, pathology, bacteriology, and epidemiology are discussed, and diagnostic methods described.

Reports of listeriosis in Gt. Britain are reviewed. During 7 years 27 cases were encountered within a small area of south-west England; 17 were in cattle, including 8 in milking cows, of which 2 excreted the organism in their milk.

Stamatin, N., Țaga, L., Moraru, E. & Gogoasă, V. (1959). Conținutul în gaze al singelui animalelor infectate experimental cu *Pasteurella animalium*. [Blood gases in sheep infected with *Pasteurella septica*. Hypoxia as the cause of death.]—*Lucr. Inst. Pat. Igiena anim.*, București 9, 259-269. [In Roumanian. Summaries in French and Russian.] 2081

Reports of human infection are reviewed briefly, and public health aspects are discussed in relation to the excretion and survival of the organism in meat and milk.

In 6 sheep with fatal experimental pasteurellosis, the O₂ content of the arterial blood fell from 10.4 to 6 volumes per 100 ml., the O₂ saturation fell from 88.1% to 47.6%, and the CO₂ content rose from 47.6 to 53.5 vol.%. In venous blood the O₂ content fell from 8.4 to 2.9 vol.% and the CO₂ content rose from 55 to 58.9 vol.%. It is concluded that leucocytes blocking the pulmonary vessels caused death from hypoxia.—M.G.G.

Calaprice, A. (1959). Sulla pasteurellosi del gatto a sintomatologia nervosa. [Pasteurellosis with nervous symptoms in the cat.]—*Zooprofilassi* 14, 767-773. 2082

Pasteurella septica was isolated from the brains of 7 cats which had died after showing nervous symptoms. They had been sent to the laboratory because they were suspected of being rabid.—T.E.G.R.

Ryu, E. (1959). **Studies on Pasteurella multocida. IV. The immunizing value of egg agar vaccine against fowl cholera.**—[Jap. J. vet. Sci. 21, 281-287. [In English. Summary in Japanese.] 2083

Formalized (0.2%) pasteurized egg agar vaccine effectively immunized mice and fowls. Intravenously it was toxic but intramuscularly, it gave protection to 80% of fowls. Its immunizing effect was superior to that of chick embryo vaccine and formalized broth culture. Addition of aluminium hydroxide gel increased the immunizing effect.—A. ACKROYD.

Zharov, V. G. & Polyakov, A. A. (1959). **[Survival of Pasteurella septica in carcasses of fowls.]**—Trudy Vsesoyuz. Inst. vet. Sanit. i Ektoparazit. 14, 47-49. [In Russian.] 2084

Pasteurella died in 2-4 months in fowl carcasses left out-of-doors in winter at temperatures of -25° to $+2^{\circ}$ C. In buried carcasses it died in 5 months. In spring, at temperatures of -13.5° to $+22^{\circ}$ C., it died in $3\frac{1}{2}$ to 4 months in heart, liver and spleen and in 2 to $2\frac{1}{2}$ months in intestines. In summer, at 8° to 29° C., it died in 25 days in exposed carcasses and in 3 months in buried carcasses.

—M.G.G.

Sandvik, O. (1960). **Serological comparison between strains of Pseudomonas aeruginosa from human and animal sources.**—Acta path. microbiol. scand. 48, 56-60. [In English. Author's summary modified.] 2085

A serological classification based on heat-resistant agglutinogens was compared with the system established by Habs (1957). Most animal strains (mostly obtained from bovine mastitis) fell within 5 of the 12 O-groups of Habs. One particular O-group seemed to predominate in both human and animal infections. The possibility of transmitting Pseudomonas infections from animals to man was discussed.

Glantz, P. J., Dunne, H. W., Heist, C. E. & Hokanson, J. F. (1959). **Bacteriological and serological studies of Escherichia coli serotypes associated with calf scours.**—Bull. Pa agric. Exp. Sta. No. 645 pp. 22. 2086

The authors examined 152 cultures of E.coli from scouring calves. They belonged to 16 different O groups. Strains belonging to groups O26, O8, O119 and O3 were shown to be pathogenic; strains of groups O101 and O109 were not pathogenic for calves. Agglutinins to types O119 and O8 occurred in sera of dam and calf less often than those to

four other groups. Consequently types 119 and 8 were isolated more often from calves with spontaneous scours than the other types. Calves which received colostrum were susceptible to experimental infection with type 8 but not with 119. Colicine activity of calf and dam sera was studied.—R.M.

Scheibner, G. (1960). **Beitrag zum Vorkommen von Dyspepsiecoli bei Schlachttieren. [Occurrence in slaughtered animals of strains of Escherichia coli associated with human infections.]**—Mh. VetMed. 15, 27-29. 2087

Of 190 strains of E. coli isolated from slaughtered animals, 4 (from the organs and lymph nodes of 3 calves and a sheep) were types pathogenic for babies.—M.G.G.

Sojka, W. J., Lloyd, M. K. & Sweeney, E. J. (1960). **Escherichia coli serotypes associated with certain pig diseases.**—Res. vet. Sci. 1, 17-27. [Authors' summary modified.] 2088

2,321 strains of E. coli isolated from pigs affected with a variety of pathological conditions—in particular enteritis and oedema disease—were examined serologically. A considerable uniformity of serotype was found and certain serotypes were predominant in one or other pathological condition. Reasons are given for believing that certain of these types are primary pathogens of pigs.

Saunders, C. N., Stevens, A. J., Spence, J. B. & Sojka, W. J. (1960). **Escherichia coli infection in piglets.**—Res. vet. Sci. 1, 28-35. [Authors' summary modified.] 2089

The results of an investigation into 58 outbreaks of disease in pigs in which E. coli was considered significant are presented.

A syndrome causing high mortality in piglets is described. In the 22 outbreaks studied the syndrome was consistently associated with certain serotypes of E. coli, and evidence is presented to suggest that they were of primary importance in its aetiology.

Gregory, D. W. (1960). **Experimental edema disease (hemolytic Escherichia coli toxemia) in pigs and in mice.**—Amer. J. vet. Res. 21, 88-94. [Author's summary modified.] 2090

Thirty pigs were given i/v injections of extracts of haemolytic E. coli. Although all pigs developed reactions following injection, none developed typical oedema disease. Of 5 pigs that died within three to 22 hours after injection, 4 showed evidence of oedema of the stomach wall.

Of 51 pigs injected i/v with potent bowel content extracts, derived from pigs that had

died from oedema disease, 35 were also injected with anti-haemolytic *E. coli* serum and 4 with bowel extract antiserum. Injection of bowel extract, alone, resulted in typical oedema disease.

Antiserum was generally effective in neutralizing the oedema disease-producing properties of the bowel extracts when the serum and extract were mixed before injection. When the bowel extract was given i/v and the serum by other routes, it was necessary to increase the quantity of antiserum and to give it for considerable periods before bowel-extract administration in order to achieve protection.

In experiments with 113 mice, using potent bowel extracts i/v or i/p, signs and lesions comparable with those of oedema disease in pigs were produced. Anti-haemolytic *E. coli* serum was generally effective in neutralizing bowel extracts whereas anti-swine fever serum, anti-swine erysipelas serum, and *Clostridium welchii* type B, C and D antitoxins were ineffective. Mice were also afforded considerable protection against the effects of bowel extracts by immunizing them with haemolytic *E. coli* extracts.

I. Mian, K. A. (1959). **Isolation of enteropathogenic *Escherichia coli* from household pets.**—J. Amer. med. Ass. 171, 1957-1961. 2091

II. Anon. (1960). ***Escherichia coli* in pets.**—Lancet February 20th, 424. 2092

I. *E. coli* was isolated from faeces of 34 of 237 apparently healthy dogs and from 7 of 84 cats. Those from dogs belonged to O groups 111, 55, 26, 127 and 125. More strains were isolated in the summer than in winter. Gastro-enteritis in a baby was associated with the serotype O55:B5. This serotype was not found in faeces of other members of the family but it was present in almost pure culture in the faeces of the family dog.

II. Comments on Mian's article.—R.M.

Bogdonoff, P. D., Pensack, J. M., Henson, J. N. & Baldwin, R. S. (1959). **Effect of coliform organisms on broiler growth.**—Poult. Sci. 38, 1355-1366. [Authors' summary modified.] 2093

Broiler chicks were fed diets containing 200 g./ton of zinc bacitracin, procaine Penicillin, oxytetracycline, chlortetracycline or dihydrostreptomycin sulphate and were inoculated weekly by mouth with cultures of *Escherichia* or *Escherichia* plus *Aerobacter*. Growth responses were obtained from combined treatment with antibiotic plus coliforms. Coliform

inoculation without antibiotics did not affect growth or feed efficiency.

Data for each antibiotic were discussed in relation to spectral selectivity. It was not suggested that coliforms were totally responsible for antibiotic responses but rather that the findings indicate the relative importance of maintaining a beneficial natural or balanced flora for full expression of "an antibiotic effect".

Friedman, D. R. & Halbert, S. P. (1960). **Mixed bacterial infections in relation to antibiotic activities. IV. *Shigella-Escherichia coli* infections.**—J. Immunol. 84, 11-19. [Authors' summary modified.] 2094

In mixed peritoneal *Shigella paradyse* *teriae-Escherichia coli* infections of adult mice an antibiotically active (colicine-producing) *E. coli* caused a reduction in the shigella organisms concomitantly with the secretion of antibiotic. When the *E. coli* partner of the mixed infection was non-antibiotic, both organisms flourished in the peritoneal cavity.

In contrast, in oral infection of new-born mice with a lethally virulent *E. coli* strain, there was no apparent difference in the slightly reduced mortality rates obtained when the pathogen was given in combination with an antibiotically active or a non-active *E. coli* strain.

This failure of the antibiotic *E. coli* clearly to protect against enteric infection was observed in spite of the fact that implantation of Strain 534 in the intestinal tract of new-born mice was demonstrated to be quite overwhelming.

New-born mice of two strains (CFI and CFW) differed significantly in their susceptibility to infection with an enteropathic strain of *E. coli*.

Anon. (1959). "Het salmonellosis-probleem", gehouden ter gelegenheid van de Algemene Vergadering van de Maatschappij voor Diergeneeskunde op 10 oktober 1959. [Symposium on the salmonellosis problem, held at Utrecht in October 1959.]—Tijdschr. Diergeneesk. 84, 1429-1449. Discussion: pp. 1450-1464. [In Dutch.] 2095

A discussion opened by A. van der Schaaf on six papers by P. Sjollem, J. F. Frik, E. H. Kampelmacher, J. H. J. van Gils, A. Clarenburg and A. van Keulen. The full texts of these papers were published between pages 1047 and 1094 of the same journal. [See also V.B. 30, 1327 & 1333.]—R.M.

Jacob, W. K. (1959). Über zuchthygienische Untersuchungen in Schafherden. [**Breeding hygiene in sheep. Examination of flocks infected with *Salmonella abortus-ovis*.**]—Berl. Münch. tierärztl. Wschr. 72, 475-479. [Summary in English.] 2096

Of 36 rams five had positive and nine doubtful serological reactions against *S. abortus-ovis*. Testicular and epididymal lesions were present in four of 43 rams. *S. abortus-ovis* was isolated from one ram with a testicular abscess, but not from preputial washings of 17 rams.—E.G.

Pigoury, L., Michel, C., Chabassol, C. & Poussot, A. (1959). Enzootie de salmonellose à *Salmonella typhi-murium*, variété copenhague, dans un élevage de lapins. [**Outbreak of *Salmonella typhi-murium* var. copenhagen infection in rabbits.**]—Rev. Cps. vét. Armée 14, 127-129. 2097

The disease (acute or subacute) affected laboratory rabbits aged 2-3 months (but not adults) and 3 g.pigs. The symptoms were rhinitis, tympanites and yellowish diarrhoea. Mortality was 40%. Diagnosis was confirmed by isolating *Salmonella typhi-murium* (in a pure state or mixed with streptococci or *Pseudomonas*) from heart blood, bone marrow, lungs, lymph nodes, liver, spleen and intestinal nodules. Chloramphenicol was used for the acute form and a killed vaccine prevented the development of the chronic form.—T.E.G.R.

Mair, N. S. & Ross, A. I. (1960). **Survival of *Salm. typhi-murium* in the soil.**—Mon. Bull. Minist Hlth Lab. Serv. 19, 39-41. [Authors' summary modified.] 2098

Studies were made on survival in accidentally contaminated soil of a small garden exposed to ordinary weather conditions. Of 80 samples of soil examined over a period of ten months, 32 proved positive. The last sample from which the organism was isolated was taken 251 days after the beginning of the experiment. As the soil must have been contaminated some time before the first sample was taken, it is probable that the survival time was not less than 280 days.

Ladehoff, G. (1959). Beitrag zur Epidemiologie von *Salmonella typhi murium* in Schleswig-Holstein. [**Epidemiology of *S. typhi-murium* infection in Schleswig-Holstein.**]—Inaug. Diss. Hanover pp. 52. 2099

L. attempted to trace the source of *S. typhi-murium* on 32 farms where the infection had been diagnosed in calves or in other animals. In 3 cases there was strong evidence

that infection had been introduced by apparently healthy geese or ducks purchased in markets. Other probable sources of infection included pigeons and gulls.—R.M.

Bierer, B. W. & Vickers, C. L. (1960). **Nitro-furan medication for experimental *Salmonella typhimurium* infection in poults.**—Avian Diseases 4, 22-37. [Authors' summary modified.] 2100

None of the nitrofurans used was completely successful in eliminating carriers of *S. typhi-murium* from the infected groups.

Quesada, A., Calaprice, A. & Accone, P. (1959). Infezione sperimentale per via cloacale di pollastre vergini con ceppi di *S. pullorum* isolati dal liquido seminale di galli naturalmente infetti. [**Experimental cloacal infection of pullets with *Salmonella pullorum* isolated from the semen of naturally infected cocks.**]—Clin. vet., Milano 82, 401-405. 2101

Strains of *S. pullorum* isolated from the seminal fluid of apparently healthy cocks were pathogenic for virgin pullets by the cloacal route. Of 8 strains inoculated 5 were recovered from organs and tissues of dead pullets. The organism was identified by bacteriological, biochemical and serological tests; it was not demonstrable by blood culture nor was it recovered from birds killed 60 days after inoculation, although many of them gave positive agglutination reactions at high titres. All the strains under test were highly antigenic. [See also *V.B.* 28, 3856.]—T.E.G.R.

Richey, D. J. & Morgan, C. L. (1960). **The effects of furazolidone on chicken *Salmonella pullorum* carriers.**—Avian Diseases 4, 48-63. 2102

Serological titres against *S. pullorum* declined in experimentally infected hens fed furazolidone as 0.022, 0.044 or 0.066% of the food for 12 days. Five weeks after treatment ceased *S. pullorum* was recovered from the organs of 2 of 8 fed 0.066%, 3 of 8 fed 0.044% and 5 of 9 fed 0.022%. A concentration of 0.044% is recommended as hens given this dosage had the highest egg yield.—M.G.G.

Francis, D. W. (1960). **Treatment of a natural infection of *Salmonella pullorum* in day-old chicks with furazolidone.**—Avian Diseases 4, 63-73. 2103

163 chicks from hens infected with *S. pullorum* were fed furazolidone as 0.011% of the ration for the first 4 weeks of life. 22% died from *S. pullorum* infection, compared with 81% of untreated chicks. At 12 weeks

5 of 87 treated chicks excreted the organism. At 5 months 18 of 67 reacted to the tube agglutination test; 14 of these 18 yielded *S. pullorum* P.M.—M.G.G.

Siegmann, O. (1960). In vitro-Versuche über die Einwirkung von Furazolidon, Hostacyclin, Chloramphenicol und Dihydrostreptomycin auf *Salmonella pullorum*. [Action of furazolidone, tetracycline, chloramphenicol and dihydrostreptomycin on *Salmonella pullorum*.]—Zbl. VetMed. 7, 94-103. [Summaries in English, French and Spanish.] 2104

Furazolidone inhibited the multiplication of 24 strains of *S. pullorum* at concentrations of 0.39–6.25 µg./ml. and killed them at 1.56–12.5 µg./ml. Tetracycline inhibited at 0.095–0.78 but did not kill even at 100 µg./ml. Chloramphenicol inhibited at 0.095–0.78 and killed at 25–50, and dihydrostreptomycin at 31.25–250 and 125–500 µg./ml. After 30 subcultures in the presence of minimal concentrations of the drugs, strains tolerated 8 times the inhibitory concentration of furazolidone, 16 of tetracycline, 64 of chloramphenicol, and after only 8 subcultures 512 of dihydrostreptomycin. This tolerance was unaltered after 30 subcultures without exposure to the drugs. Partial cross-resistance between tetracycline and chloramphenicol was seen.—M.G.G.

Taylor, J. (1959). Why christen a salmonella?—Int. Bull. bact. Nom. Taxon. 9, 159-164. 2105

The Director of the *Salmonella* Reference Laboratory in London gave her reasons for not naming members of the *Salmonella* group.

Cameron, H. S. (1959). Eradicating brucellosis from an area using ring, whey, and blood tests.—J. Amer. vet. med. Ass. 135, 449-452. 2106

In a pilot eradication scheme in Marin county, California, all animals positive to either the whey plate agglutination test or the blood agglutination test were removed from the herd and slaughtered. When results of blood and whey tests differed, milk was inoculated into g.pigs. Between April 1957 and September 1958 the percentage of infected herds was reduced from 30 to 4.

—A. ACKROYD.

Ancykowski, F. (1959). Sur la standardisation de la suspension colorée pour l'agglutination de "Br. abortus". [Standardization of stained *Brucella abortus* antigen.]-Bull. Off. int. Epiz. 51, 656-664. 2107

A French version of work published in Polish [see *V.B.* 30, 36 & 348].—R.M.

Ovejero, S., Rejas, F. & Villalón, F. (1958). Contribución al estudio de la prueba del anillo (ring-test) en la brucelosis ovina y caprina. [The ring test on milk for brucellosis in sheep and goats.]-An. Fac. Vet. Leon 4, 23-39. [Summaries in English and French.] 2108

The test failed to give results with milk from infected sheep or goats, but it became reliable if the milk was mixed in a proportion of 1:10–1:30 (sheep) or 1:50–1:60 (goats) with milk from uninfected cows. Results were improved when fat was removed by treatment of the milk with chloroform.—R.M.

Caldas, A. D. & Nesti, A. (1958). Ocorrência da brucelose caprina no estado de São Paulo causada pela *Brucella abortus*. Observações sobre um surto de caráter epizootico. [Occurrence of *Brucella abortus* infection in goats in the State of São Paulo.]-Arch. Inst. biol. S. Paulo 25, 139-149. [Summary in English.] 2109

An epidemic of abortion involving 200 goats was associated with *Br. abortus* infection. Infection probably came from cows on the same farms or from skim milk which was fed to the goats for a few days. Two years after abortion serological tests and attempts to isolate brucella were negative and there was no further abortion.—R.M.

Voroshilov, K. P. (1960). [Quicker discharge of recovered cattle from isolation units for brucella reactors.]-Veterinariya, Moscow 37, No. 1 pp. 19-22. [In Russian.] 2110

1,287 infected cows that had been on isolation farms for at least 3 years were examined by c.f. and agglutination tests on two occasions 3 months apart. 682 were negative on each occasion and it was considered safe to vaccinate them and to place them in vaccinated herds. 2-4 weeks after vaccination 81% gave positive serological tests. Six months after vaccination only 13% were positive, while 24% of healthy vaccinated cows were still positive at this time. Quarterly examinations over two years failed to detect relapse or spread of infection to healthy cows. Those that failed to pass the two tests were slaughtered. A further 3,616 cows on 15 isolation farms were similarly dealt with; 2,576 passed the tests. There was no spread of infection when 45 of the vaccinated cows

that passed the tests were placed in a herd of 58 unvaccinated healthy calves, cows and heifers.—R.M.

Morgan, W. J. Brinley & McDiarmid, A. (1960). **The excretion of *Brucella abortus* in the milk of experimentally infected cattle.**—Res. vet. Sci. 1, 53-56. [Authors' summary modified.] 2111

Milk samples from 45 cows of 4 groups artificially infected with *Br. abortus* were examined culturally throughout their first lactation after infection. 16 were controls; and vaccine groups 1, 2 and 3 had received, respectively, a single dose of adjuvant vaccine (14 cows), 2 doses adjuvant vaccine (9 cows), and a single dose of Strain 19 (6 cows). Excretion was intermittent, varying in individual cows from 2 to 84% of samples.

Generally, excretion was more consistent and more abundant during the latter part of lactation, although, in a few cases, excretion seemed to have ceased during this period.

In those animals vaccinated before infection but which became infected, the overall weight of infection in the milk was less than in non-vaccinated animals. The proportion of culturally positive samples obtained from the controls varied from 8 to 81% (average 53%). For vaccine 1 group the range was 3 to 84% (average 38%); for vaccine 2 group, 0 to 77% (average 12.5%); and for vaccine 3 group, 0 to 26% (average 8%).

Nine of the ten animals examined during their second lactation after infection were still excreting the organism.

Bauer, F. (1959). Über die Bewertung von Therapie-Erfolgen bei experimentellen Brucellen-Infektionen. [Evaluation of results of treatment in experimental brucellosis.]—Tierärztl. Umsch. 14, 365-367. 2112

Peak numbers of *Brucella abortus* were found in the blood of mice 15 min. after s/c infection, 15-30 min. after oral infection and 1-2 hours after i/p infection. In 3 rabbits peak numbers were found in the blood one hour after i/p infection; after 8 hours it was no longer isolated from the blood; it multiplied in the spleen until about the 5th day, then numbers declined quickly; in the liver it decreased in number from the 1st day and was no longer demonstrable after the 19th day. Survival of mice given a lethal i/p dose of *Br. abortus* was better when pyrrolidinomethyl tetracycline (0.8 mg. i/v per 20 g. body wt.) was injected 3 hours after infection than when it was given immediately after, 1½ or 6 hours

after infection. These findings were discussed in relation to the evaluation of treatment of brucellosis in lab. animals.—M.G.G.

Schuster, E. O. (1959). Ein Beitrag zur Frage der Beurteilung serologischer Reaktionen brucellinisierte Schafe. [Positive serological reactions in sheep inoculated with brucellin.]—Rindertuberk. u. Brucellose 8, 163-170. 2113

Flock tests in the Krefeld area indicated that after three brucellin tests at intervals of 4 months the proportion of sheep that gave positive reactions to agglutination tests increased from 2% to 34% but the number of reactors to the c. f. test did not change.

—R.M.

Hoffmann, F., Szabó, A. & Szakmáry, G. (1959). **The growth of brucella B-19 strain in fermentation apparatus.**—Acta vet. Acad. Sci. hung. 9, 413-418. [In English.] 2114

An English version of a paper previously published in Hungarian [*V.B.* 29, 3395].

—R.M.

Geissler, A. (1959). Die Immunreaktionen der weissen Maus nach der Impfung mit Abortus-Bang-Impfstoffen. [Evaluation of brucella vaccines by the immune reaction in mice.]—Zbl. VetMed. 6, 981-992. [Summaries in English, French and Spanish.] 2115

Mice inoculated intraperitoneally with Strain 19 of *Br. abortus* developed resistance in 24-48 hours that reached its maximum within 72 hours. Resistance was not correlated with the number of organisms injected. After subcutaneous inoculation immunity first appeared on the 3rd day and reached its peak on the 12th day. There was an almost linear relationship between the degree of immunity and the number of organisms injected. It was concluded that brucella vaccines can be evaluated by the immunity that they induce through s/c inoculation of mice.—M.G.G.

I. Börger, K. (1960). Versuch einer Typendifferenzierung (*Brucella abortus*-*Brucella melitensis*) durch Pathogenitätsprüfungen an tragenden Ziegen. [Differentiation of *Brucella abortus* and *Br. melitensis* by pathogenicity tests in pregnant goats.]—Dtsch. tierärztl. Wschr. 67, 120-123. [Summary in English.] 2116

II. Karsten, F. (1960). Versuch einer Typendifferenzierung (*Brucella abortus*-*Brucella melitensis*) durch Pathogenitätsprüfungen an tragenden Ziegen. (Stellungnahme zu dem vorstehenden gleichnamigen Artikel von K.

Börger.) [Differentiation of *Br. abortus* and *Br. melitensis* by pathogenicity tests in pregnant goats. Comments on preceding paper.]

—Ibid. 123-124. [Summary in English.] 2117

I. Following a suggestion of Karsten [see *V.B.* 30, 350] that pregnant goats could be used to distinguish *Br. melitensis* from *Br. abortus*, 2 goats in the second half of pregnancy were fed milk from a cow naturally infected with *Br. melitensis*. One aborted, and the organs of both yielded *Br. melitensis*. A pregnant goat fed cow's milk containing *Br. abortus* did not become infected. It was concluded that brucella strains with the biochemical and serological properties of *Br. melitensis* isolated from cattle in Schleswig-Holstein [see *V.B.* 29, 3745] must also be pathogenic for goats and therefore in fact *Br. melitensis*, and not *Br. abortus*, as Karsten had suggested. The author does not in any case agree with Karsten's theory that brucella should be classified according to pathogenicity for different species of animals.

II. K. stated that the results of Börger's experiments in goats [I. *supra*] do not warrant the conclusion that brucella strains isolated from cattle in Schleswig-Holstein were *Br. melitensis* and not *Br. abortus*.—M.G.G.

Heckly, R. J., Faunce, K., Jr. & Elberg, S. S. (1960). **Lyophilization of *Brucella melitensis***.—*Appl. Microbiol.* 8, 52-54. [Authors' summary modified.] 2118

Survival of cultures of a vaccine strain of *Br. melitensis* (Rev 1-S) to which equal volumes of 6% solutions of lactose, sucrose, or glucose had been added was comparable when tested immediately after freeze-drying. But after 125 days of storage at room temperature, the viability of the culture with glucose was much less than that of cultures containing either lactose or sucrose.

At freezing point there was no loss of viability of cultures freeze-dried with sucrose after storage for 225 days, but at room temperature only 0.1% survived, and at 37°C. almost no cells remained viable. In no instance was there a significant change in dissociation.

Although neither the freezing nor the drying method affected viability when tested immediately afterwards, viability was best maintained in cultures which were snap frozen and dried at about -18°C.

Ganado, W. & Bannister, W. (1960). **Bacteraemia in human brucellosis**.—*Brit. med. J.* February 27th, 601-603. [Authors' summary modified.] 2119

Of blood and of bone-marrow cultures from human cases of brucellosis, *Brucella melitensis* was recovered from 69.8 and 66.7% respectively. Brucellosis, bacteraemia is apparently unrelated to pyrexia. Brucellosis should be a fruitful field for the elucidation of the mechanism of pyrexia in man.

Karsten, F. (1960). Über die Entstehung der Brucellosis suis aus der *Brucella melitensis* und ihre Bedeutung für die Tilgung der Brucellosen der Haustiere und des Wildes. [***Brucella suis* as a mutant of *Br. melitensis***.]—*Dtsch. tierärztl. Wschr.* 67, 93-98. [Summary in English.] 2120

K. concluded, from a review of the literature on brucellosis in pigs, that *Br. suis* can arise from both *Br. melitensis* and *Br. abortus*. He discussed the significance of cross-infections between species of animals, in relation to control and the danger for human beings.

—M.G.G.

Lehnert, C. (1959). Zur serologischen Diagnose bei Schweinebrucellose. [**Serological diagnosis of brucellosis in pigs**.]—*Mh. VetMed.* Suppl. No. 1 pp. 65-69. 2121

High tube-agglutination titres are rare in pigs infected with *Brucella suis*. Higher titres are obtained with the Coombs test, which is also more sensitive than the agglutination test. Non-specific agglutination occurs in about 50% of healthy pigs in dilutions of 1:10, 1:20, and, more rarely, 1:80. Agglutination at 56°C. reduces the number of non-specific reactions considerably, without greatly affecting titres.

—E.G.

Hipólito, O., Lamas da Silva, J. M. & Barbosa, M. (1958). Sobre dois casos de orquite brucélica em suínos. [***Brucella orchitis* in two boars in Brazil**.]—*Arch. Esc. Vet. Minas Gerais* 11, 345-349. [Summary in English.] 2122

An illustrated account of the first cases reported in Brazil. *Brucella suis* Type I was isolated from the testicles.—R.M.

Jivoin, P., Nicolescu, A., Leluțiu, C., Sotiriu, E., Drăghici, T. & Cheregi, T. (1959). Studiul leptospirozei la cabaline. [**Studies on leptospirosis in horses in Roumania**.]—*Lucr. Inst. Pat. Igiena anim., București* 9, 41-57. [In Roumanian. Summaries in French and Russian.] 2123

A report on 9 outbreaks of *L. pomona* infection. In 2, pigs were the source of infection. Iridocyclitis and periodic ophthalmia were noted.—M.G.G.

Kraminskaya, N. N., Eskin, V. A. & Zhuk, N. F. (1959). [Role of leptospires in the aetiology of equine periodic ophthalmia.]—*Veterinariya*, Moscow 36, No. 12 pp. 13-17. [In Russian.] 2124

The authors claimed to have set up a condition in g.pigs similar to periodic ophthalmia in horses by infection with *Leptospira monja-kov* [*pomona*] and *L. grippo-typhosa*. The disease in horses in the Far East of the U.S.S.R. (Vladivostok-Khabarovsk area) was associated with high serum titres against *L. pomona*, *ussuri*, *grippo-typhosa* and *saxkoe-bing*.—R.M.

Smith, R. E., Reynolds, I. M. & Sakai, T. (1960). Experimental leptospirosis in pregnant ewes. I. Clinical, bacteriological, and serological features.—*Cornell Vet.* 50, 34-46. [Authors' summary modified.] 2125

Four groups of sheep were inoculated i/m with *Leptospira pomona*. Of 17 inoculated pregnant ewes, *L. pomona* was recovered from the placenta and/or foetal fluids of three by direct culture or hamster inoculation. Leptospire were recovered at least once from caruncle, cotyledon, amniotic fluid, and foetal blood from umbilical vessels. Three of the infected sheep developed severe haemolytic anaemia; one died and two were killed when moribund.

It appears from these data that leptospire can in some instances penetrate the placental barrier in sheep.

Morter, R. L., Morse, E. V. & Langham, R. F. (1960). Experimental leptospirosis. VII. Re-exposure of pregnant sows with *Leptospira pomona*.—*Amer. J. vet. Res.* 21, 95-98. [Authors' summary modified.] 2126

The immunity produced by active infection was sufficient to protect pregnant sows and their foetuses against challenge with a virulent strain of *L. pomona*. Such animals should be satisfactory to retain for breeding purposes.

Active inflammatory processes appear to persist in the porcine kidney for 10-14 months after initial infection and 8-10 months after leptospire are demonstrated in the urine.

Fuchs, G. H. P. & Walther, H.-J. (1959). Beiträge zur Leptospirenzüchtung. II. Mitteilung. Einfluss von Haemoglobin auf das Wachstum pathogener Leptospiren. (Zugleich eine Betrachtung zum Anlegen von Blutkulturen). [Cultivation of leptospire. II. Influence of haemoglobin.]—*Zbl. Bakt. I.*

(Orig.) 175, 570-581. [Summaries in English, French, Spanish and Russian.] 2127

Addition of various amounts of haemoglobin to cultures of 8 pathogenic leptospire on Korthoff's medium with 20% sheep serum showed that most strains tolerated a haemoglobin concentration of up to 7 mg.% and some tolerated 27 mg.% *L. autumnalis* A was the only strain that required haemoglobin for growth. For isolating the organisms from blood, not more than 4 drops of blood should be added to 10 ml. of medium.—R.M.

Wagenaar, G. (1960). De behandeling van kalveren met boutvuur. [Penicillin treatment of blackleg in calves.]—*Tijdschr. Diergeneesk.* 85, 210-212. [In Dutch. Summaries in English, French and German. English summary modified.] 2128

In one calf the process was localized in the right hindquarter and in the other in the neck.

Both were treated with 1.3 mega units of penicillin daily for 5 days. In one a part of the biceps femoris muscle sloughed, in the other the swelling vanished gradually. Both animals recovered.

Tomić, L. & Foršek, Z. (1959). Studij o aktivnoj imunizaciji protiv šuštačva i parašuštačva. I. Neka svojstva vakcinalnih sojeva *Cl. fesceri* i *Cl. septicum*. [Active immunization against blackleg and malignant oedema. I. Properties of strains of *Clostridium chauvoei* and *Cl. septicum*.]—*Vet. Arhiv* 29, 347-356. [In Croat. Summaries in English and French.] 2129

The authors studied antigenic properties and virulence of five strains of *Clostridium chauvoei* and two strains of *Cl. septicum* by i/m inj. in sheep and g.pigs. *Cl. chauvoei* was more virulent for sheep than for g.pigs. The haemolytic properties of toxins were studied by their action on washed sheep r.b.c.; their toxicity by i/v inj. in mice. Two of the *Cl. chauvoei* strains produced a toxin which had characteristics similar to delta-toxin (oxygen-labile haemolysin), whereas the two *Cl. septicum* strains produced alpha-toxin (necrotic oxygen-stable haemolysin).—E.G.

Hreczko, I. (1959). Infectious necrotic hepatitis in sheep in South Australia, possibly associated with *Cysticercus tenuicollis*.—*Aust. vet. J.* 35, 462-463. 2130

A case of infectious necrotic hepatitis (black disease) is described in a sheep in which

the activating cause was *C. tenuicollis* instead of the more usual *Fasciola hepatica*.

—H. McL. GORDON.

Bittner, J. (1959). Immunisation active expérimentale avec l'anatoxine vibron septique, purifiée, concentrée et adsorbée sur phosphate d'aluminium. [Immunization of sheep with adsorbed *Clostridium septicum* vaccine.]—Arch. roum. Path. exp. Microbiol. 18, 181-193. [In French. Summaries in English, German and Russian.] 2131

Nine sheep given 3 i/m injections, at intervals of 3-4 weeks, of purified, concentrated *Cl. septicum* toxoid adsorbed on aluminium phosphate developed serological titres of 1-35 (average 8) antitoxin units per ml. After booster injections 15 and 26 weeks later in 6 and 3 sheep, respectively, the average titres were 6 and 11.6 antitoxin units per ml. Titres remained high for about a month after each injection. The 3 sheep given 2 booster injections resisted inoculation with up to 1,000 MLD₅₀ of *Cl. septicum* spores. Trials in mice and g.pigs were described.—M.G.G.

Smith, H. Williams, (1959). The bacteriophages of *Clostridium perfringens*.—J. gen. Microbiol. 21, 622-630. [Author's summary modified.] 2132

A search was made for phages active on *Cl. welchii* types A, B, C, D, E, and F. Twelve of 49 type A strains, 10 of 31 type B strains, 10 of 26 type C strains and none of either 38 type D, 5 type E or 3 type F strains were lysogenic. The "temperate" phages obtained from these lysogenic cultures, together with similar phages obtained from crude material, such as sewage, were isolated; some of them were very host-specific. It was possible to induce partial lysis in lysogenic strains by ultraviolet radiation, nitrogen mustard and mercaptoacetic acid.

Other phages isolated from crude material resembled the 'virulent' phages of aerobic bacteria. These phages lysed strains belonging to types A, B, C, D, and F.

Despite a long search, a high proportion of the strains remained insusceptible to all the phages isolated. A close relationship between phage susceptibility and colonial morphology was noted. Smooth and rough strains were usually phage-resistant.

Kaufman, L. & Weaver, R. H. (1960). Rapid methods for the identification of clostridia.—J. Bact. 79, 119-121. [Authors' summary modified.] 2133

The authors described rapid methods for the detection of carbohydrate fermentation and for the simultaneous detection of gelatin hydrolysis and indole formation by clostridia. The methods were simple, economical, and gave reliable results.

Butozan, V., Horvatic, I. & Tomić, L. (1959). Kretanje i suzbijanje anaerobne dizenterije janjadi (lamb dysentery) u Bosni i Hercegovini. [Control of lamb-dysentery in Bosnia and Hercegovina.]—Veterinaria, Sarajevo 8, 451-469. [In Croat. Summary in English.] 2134

In Bosnia and Hercegovina incidence of lamb dysentery is higher in mountainous areas than in the mild Mediterranean coastal regions. This is explained by nutritional and vitamin deficiencies in mountainous areas, where green fodder is available for a much shorter period than in the milder regions. Fascioliasis, of much higher incidence in the mountains than in coastal zones, may also affect resistance. Details are given of the clinical picture in 40, and P.M. findings in 195 lambs. Apart from *Clostridium welchii* Type B, the following were isolated: *Cl. sporogenes* Type A, *Cl. welchii* Type A, *Proteus vulgaris*, *Escherichia coli*, *Bacillus subtilis*, etc. Preventive measures included vaccination of pregnant ewes with a polyvalent vaccine, a balanced diet and better hygienic conditions.—E.G.

Hipólito, O., Lamas, J. M. & de Godoy, A. M. (1958). Otitis média dos suínos. [Otitis media in pigs.]—Arch. Esc. Vet. Minas Gerais 11, 351-356. [Summary in English.] 2135

Corynebacterium pyogenes was isolated from 7 of 8 cases, staphylococci from 5 and *Past. septicus* from 3. Histological examinations indicated that infection reached the middle ear through the Eustachian tube.

—R.M.

Trainer, D. O., Jr. & Hanson, R. P. (1960). Leptospirosis and brucellosis serological reactors in Wisconsin deer, 1957-1958.—J. Wildlife Mgmt 24, 44-52. [Authors' summary modified.] 2136

Only one reactor to *Brucella abortus* was detected among the 600 deer tested. From these results and the reports of other investigators, it appears that brucellosis is not an important disease in white-tailed deer. Leptospirosis reactors were found in all areas with heavy deer populations. The average titre of reactors was 1:1,000. [See also *V.B.* 30, 363 & 641.]

Nava, G. A. (1959). Alcuni esami di laboratorio nella diagnosi differenziale fra piometra ed endometrite nella cagna. [Laboratory tests for differential diagnosis of pyometra and endometritis in the bitch.]—*Veterinaria*, Milano 8, 245-251. [Summaries in English, French, German, Spanish and Portuguese.] 2137

Results of examination of blood samples from 69 bitches led to the conclusion that the sedimentation rate, w.b.c. count and formula and, to a certain extent, vaginal cytology form the basis of differential diagnosis between pyometra and endometritis.—T.E.G.R.

Böhme, D. & Bouvier, C. A. (1959). Influence of infection upon the reticuloendothelial system, internal organs, and distribution of circulating leucocytes of normal albino mice.—*J. infect. Dis.* 105, 222-237. 2138

Mice injected i/v with *Mycobacterium fortuitum* or *Staphylococcus aureus* developed fatal pyelonephritis. Infection with *M. fortuitum* was similar to TB. in certain respects, with histiocytic proliferation in liver and spleen as the main features; there was also a lasting polymorphonuclear leucocytosis. The rate of clearance of injected carbon particles was high. When *Staph. aureus* was injected there was a rapidly fatal disease. There was metaplasia of the lymph nodes and relative granulocytic leucocytosis in the peripheral blood. The reticuloendothelial system did not respond to infection. In neither disease were there any marked changes in the lungs, except parietal non-obstructing thrombosis.

—T.E.G.R.

Garrod, L. P. (1960). Relative antibacterial activity of three penicillins.—*Brit. med. J.* February 20th, 527-529. [Author's summary modified.] 2139

A comparison was made between the antibacterial activity *in vitro* of benzylpenicillin (G), phenoxymethylpenicillin (V), and the potassium salt of 6-(alpha-phenoxypionamido) penicillanic acid (B).

The usual order of activity against penicillin-resistant staphylococci, in a form of test which measures resistance to penicillinase, was B>V>G, with wide differences.

The order against streptococci and pneumococci was G>V>B, with only small differences.

The order against *Haemophilus influenzae* and *Proteus* was also G>V>B, with considerable differences between G and the other two.

† Funke, H. (1960). Bovin mastit med fynd av jästsvampar i juversekretet. [Bovine mastitis associated with fungi.]—*Nord. VetMed.* 12, 54-62. [In Swedish. Summaries in English and German.] 2140

At the State Veterinary Institute in Stockholm fungi were isolated from 21 quarters between 1954 and 1956. In 17 cases the fungi were indentified as *Candida parapsilosis*, *C. krusei*, *C. zeylanoides*, *C. pulcherrima*, *Torulopsis famata*, *T. sake* or *Rhodotorula mucilaginosa*. Infection was often associated with cell counts of more than 500,000 leucocytes per ml. of milk. The features of mycotic mastitis were described. Most cases had not been previously treated with antibiotics.—R.M.

✓ de Gracia Mira, A. (1959). Identificación en España de un tipo de mamitis bovina de etiología levaduriforme. [Mycotic mastitis in cows in Spain, caused by *Cryptococcus neoformans*.]—*Bol. Inf. Cons. Col. vet. Esp.* 6, No. 146 pp. 5-24. 2141

A detailed account of infection in one herd.—R.M.

† Gustafson, B. A. (1960). The occurrence of yeasts belonging to genus *Pityrosporum* in different kinds of animals.—*Acta path. microbiol. scand.* 48, 51-55. [In English. Author's summary modified.] 2142

By direct microscopy *Pityrosporum*-like fungus was seen in samples from the outer auditory canal from 29 pigs, 24 cows, 11 horses, 2 roe-deer and in skin samples from 4 elks. In the primary cultures moulds often occurred, but yeasts of the genus *Pityrosporum* were isolated from 10 pigs, 8 cows, 4 horses and one elk. Nine strains from pigs and the strains from cow and horse were classified as *P. ovale*. 2 strains from pigs were classified as *P. canis*. The strain from elk was similar to *P. ovale*.

Pityrosporum occurs commonly in many different animals in the outer auditory canal and on the skin.

✓ Rhoades, H. E., Helper, L. C. & Fritz, T. E. (1960). Canine histoplasmosis with intestinal involvements.—*J. Amer. vet. med. Ass.* 136, 171-173. [Authors' summary modified.] 2143

Histoplasma capsulatum was isolated from faeces of a dog with persistent diarrhoea and from the liver, spleen, lungs, mesenteric lymph nodes, and bronchial lymph nodes. The cellular reaction was granulomatous. There was severe haemorrhagic catarrhal enteritis

with focal ulceration throughout the intestine. The mesenteric and ileocaecal lymph nodes were enlarged.

- ✓ La Touche, C. J. (1959). **Mouse favus due to *Trichophyton quinckeanum* (Zopf) MacLeod & Muende: a reappraisal in the light of recent investigations. Parts I, II & III.**—Mycopathologia 11, 257-267, 267-276 & 277-286. [In English. Abst. from author's summaries.] 2144

I. A review of the literature of "mouse favus" in mice and man and its aetiological agent *T. quinckeanum* revealed much divergence of opinion; the author described the clinical features in 22 human patients and in 2 cats. Most of the lesions in the human patients occurred on the glabrous skin. In the two kittens multiple lesions with scutula were present.

II. In kittens and mice inoculated with lesion material and cultures of *T. quinckeanum* and in g.pigs inoculated with cultures, lesions with scutula developed, but in g.pigs the scutula, which were in an incipient stage of development, were masked by excessive inflammatory reaction. Re-inoculation of previously infected kittens resulted in abortive lesions in which scutula were not formed and the inflammatory response was of short duration.

III. Although the parasite was confined to the outermost layer of the epidermis it was also capable of invading the hair shaft and inner follicle sheath and of producing arthrospores both within the hair shaft and outside it (ecto-endothrix). The main inflammatory response of the host was massive infiltration of the dermal and epidermal tissues by serous exudate and polymorphonuclear leucocytes, other features being undermining of the scutulum by pools of pus, formation of discrete peri-follicular microabscesses in the dermis, engorgement of capillaries, oedema, and parakeratosis.

- ✓ Chattaway, F. W., Townsley, J. D. & Barlow, A. J. E. (1959). **Effect of steroids and related compounds on the growth of dermatophytes.**—Nature, London. 184, Suppl. No. 22 pp. 1731-1732. 2145

Growth of dermatophytes was strongly inhibited by certain steroids, of which deoxycortone was the most active. Others (cholesterol, cortisone) had no inhibitory action. The inhibitory activity was not related to physiological function and the less polar acetates were less active.—A. ACKROYD.

- ✓ Hellmann, E. (1959). **Seuchenartiger Verlauf einer Pneumomykose bei Eintagsküken. [Pneumonomycosis in day-old chicks.]**—Berl. Münch. tierärztl. Wschr. 72, [No. 23.] 465-467. [Summary in English.] 2146

An outbreak of pneumonomycosis in 745 newly-hatched chicks, housed on litter of sawdust and wood shavings, was brought under control within four days of changing litter and food, both of which proved to be heavily contaminated with *Aspergillus*, *Mucor* and *Penicillium* spp. One table-spoonful of a 33% solution of potassium iodide was added to the drinking water for every 200 birds. Lesions in the respiratory and digestive system were described.—E.G.

- ✓ Awad, F. I. (1959). **Nocardiosis in the dog in the Sudan.**—Zbl. VetMed. 6, 919-924. [In English. Summaries in French, German and Spanish.] 2147

Two cases are described, one in an Alsatian aged 15 months in which the infection was external and not lethal, the other in a 4-month-old pup which had external abscess and fistula formation, but also had multiple abscesses in the lungs. This animal died. *Nocardia asteroides* var. *gypsoides* was diagnosed and detailed morphological, cultural and pathogenic characteristics given. Five photomicrographs are reproduced.

The organism was sensitive to chloramphenicol, oxytetracycline and penicillin. Since 1942, seven cases of canine nocardiosis have been reported from the Sudan.

—IRENE M. GRISEDALE.

- ✓ Galati, P. (1959). **Su due casi di angiocoliti catarrali croniche da miceti in suini. [Chronic catarrhal cholangitis caused by fungi in pigs.]**—Acta. med. vet., Napoli 5, 55-66. [Summaries in English and French.] 2148

An account of biliary cirrhosis in 2 slaughtered pigs. Histological examination revealed blastospores in the lumina and walls of the bile ducts and the condition is therefore ascribed to a fungus—unidentified because its isolation was not achieved.—T.E.G.R.

- Cottew, G. S. (1960). **Indirect haemagglutination and haemagglutination inhibition with *Mycoplasma mycoides*.**—Aust. vet. J. 36, 54-56. [Author's summary modified.] 2149

Sheep red cells after exposure to fluid cultures or washed cells of the bovine contagious pleuropneumonia organism, or to derived polysaccharide fractions, were agglutinated specifically by the sera of infected

cattle. This indirect haemagglutination [HA] reaction may provide a useful supplementary diagnostic test, and the HA inhibition reaction may be applicable to rapid testing of exudates suspected of containing the causal organism or its products.

Villemot, J. M. & Provost, A. (1959). Recherches immunologiques sur la péripneumonie. V. Relations antigéniques entre *Mycoplasma mycoides* var. *mycoides*, *Mycoplasma mycoides* var. *capri* et d'autres micro-organismes du genre *Mycoplasma*. (Souches génitales bovines et humaines.) [Immunological studies on pleuropneumonia. V. Antigenic relationship between pathogenic and saprophytic strains of PPLO from cattle, goats and human beings.]—Rev. Elev. 12, 251-266. [Summaries in English and Spanish.] 2150

Common antigenic fractions for *Mycoplasma mycoides* (var. *mycoides* and *capri*), *laidlawi*, *bovis genitalium* and *hominis* were demonstrated by cross agglutination and gel precipitation and by a study of the bactericidal action of antibodies. This explains the false positive reactions in the field with the rapid slide agglutination test in the case of cattle harbouring pathogenic or saprophytic P.P.L.O. in the genital tract. These antigenic relationships common to the different P.P.L.O. suggest a common species with *M. mycoides* as the type strain. In view of the universal interest in P.P.L.O. it is hoped that a serological classification of organisms belonging to the genus *Mycoplasma* will be established in the near future.—T.E.G.R.

Lindley, E. P. (1959). An investigation into the virulence for mice of certain strains of *Asterococcus mycoides*.—Bull. epiz. Dis. Afr. 7, 235-242. [Summary in French. English summary modified.] 2151

Three strains of the organism of bovine contagious pleuropneumonia of different levels of virulence for cattle were tested in mice. No difference in the I.D.₅₀ for mice was found between a fully virulent strain (B₁) and a strain of intermediate virulence (A₅₅), but in the case of the strain avirulent for cattle (KH₃J), the I.D.₅₀ was significantly higher than the I.D.₅₀ for the other two strains.

Otte, E. (1960). Clinical studies on "Abu nini" in the Sudan: a contagious disease of goats and sheep, possibly caused by pleuropneumonia-like organisms.—Vet. Rec. 72, 140-145. [Author's summary modified.] 2152

The clinical and pathological picture of

"Abu nini" is described. The disease occurs in 3 different forms: (1) septicaemic, with acute or peracute course; (2) thoracic; and (3) involvement of the reproductive tract.

The similarity between "Abu nini" and caprine contagious pleuropneumonia is discussed. It is suggested that CCPP should no longer be regarded as a condition affecting the thoracic organs only; septicaemic forms have been encountered and abortion is a common feature in this disease.

Skamser, L. M. & Seeger, K. C. (1960). Aureomycin chlortetracycline as a preventive for experimental synovitis in chickens.—Avian Diseases 4, 42-48. 2153

Chlortetracycline was fed to chickens at the rate of 100 g. per ton of food for 36 days, beginning 10 days before injection of synovitis agent into the foot pad or sinus. Symptoms developed in a much smaller percentage than in untreated controls and transmission to in-contact birds was reduced. Chlortetracycline at 50 g. per ton was less effective.—M.G.G.

McGaughey, C. A. & Seneviratna, P. (1959). The presence of Nelson's coccobacillary coryza and chronic respiratory disease in the domestic fowl in Ceylon.—Ceylon vet. J. 7, 47-50. [Authors' summary modified.] 2154

The presence in Ceylon of chronic respiratory disease and Nelson's coccobacillary (PPLO) coryza is recorded: both diseases appear to be widespread and may cause serious economic losses. Both can be controlled by the continuous administration of small amounts of chlortetracycline or oxytetracycline in drinking water or mash.

Akashi, A. (1959). Studies on the cellulose-decomposing bacteria found parasitic in the alimentary canal in ruminants and other animals. I. On the isolation of the bacteria. II. On the isolation of the bacteria by the use of galactose-fuchsin agar and Omeliansky agar.—J. Fac. Agric. Kyushu Univ. 11, 191-199 & 201-207. [In English.] 2155

Methods were devised to isolate mesophilic and thermophilic cellulose-decomposing bacteria in pure culture from diluted rumen contents of cows in 30-50 days. On an inorganic salts agar medium containing galactose and fuchsin and, to a less extent, on Omeliansky's medium solidified with agar, cellulose-decomposing bacteria produced whitish, yellowish or reddish brown pigmented colonies and these could be separated from the commonly occurring bacteria which did not grow

well on these media and, in most cases, produced white coloured colonies. Preliminary shake culture in Omeliansky's medium without the addition of a filter paper was advisable in the case of the white pigmented colonies.

—A ACKROYD.

Overås, J. (1959). *Eperythrozoon ovis*—en ny

See also absts. 2424 (book, infectious diseases of domestic animals); 2425 (book, brucella infection and undulant fever in man).

blodparasitt hos sau i Norge. [*Eperythrozoon ovis* in sheep in Norway.]—Nord. VetMed. 11, 791-800. [In Norwegian. Summaries in English and German:] 2156

The parasite was found in the blood of lambs used for experiments on tick-borne fever. Infection was associated with fever and anaemia.—R.M.

DISEASES CAUSED BY PROTOZOAN PARASITES

Wilson, S. G. (1960). **Animal trypanosomiasis in Northern Nigeria.**—In "Symposium on animal trypanosomiasis" pp. 37-52. [London: Commission for Technical Co-operation in Africa South of the Sahara (C.C.T.A.) Publ. No. 45.] [Author's summary modified.] 2157

A brief account is given of the history of trypanosomiasis in Northern Region and its close association with nomadism. The infection rate was 10 to 30% of all cattle grazing during the dry season in the Guinea grass vegetation zone.

The importance of tsetse survey and control is emphasised and the association of tsetse distribution on the vegetation and prevailing climate is described for both the Sudan and Guinea zones.

The recession of *G. morsitans* during the harmattan season provides the solution to the control of this species in the Sudan zone by use of insecticides.

G. morsitans has shown considerable advances in the marginal Guinea-Sudan vegetation zones and economic control in these areas has not been devised.

The distribution of *G. longipalpis* is briefly described.

The gradual growth of chemotherapy over the past 30 years is described culminating in the present widespread use of Ethidium and Antrycide at the rate of 640,000 doses per annum.

The problems presented by the use of drugs on this scale are briefly described.

Boehringer, E. G., Fornari, O. E. & de Boehringer, I. K. (1959). Terapéutical del "mal de caderas". Ensayo de una nueva droga. (Primera comunicación.) [*Treatment of Trypanosoma equinum infection with "Ganaseg"*.]—Rev. Invest. Ganad. No. 6 pp. 139-150. 2158

This drug, also known as "Berenil", was tested on infected lab. animals and 3 horses.

A single dose of 3 mg./kg. body wt. injected i/m resulted in temporary recovery with relapse about 8-10 days after treatment.—R.M.

Fromentin, H. (1959). Crises trypanolytiques et variations antigéniques de *Trypanosoma gambiense* chez la souris. [*Trypanolytic crises and antigenic variations of Trypanosoma gambiense in mice.*]—Bull. Soc. Pat. exot. 52, 423-426. 2159

In experimentally infected mice treated with subcurative doses of tryparsamide (causing temporary disappearance of the trypanosomes from the blood stream) the parasites which subsequently reappeared in the blood stream belonged to a different antigenic type. It is considered that in complete crises in the circulating blood there is a brief interval during which some of the trypanosomes which migrate from the blood stream to different organs undergo a change in their antigenicity while the others do not. In this case it would be possible to isolate from the different organs lines of trypanosomes belonging to two or more different antigenic types.—T.E.G.R.

Trager, W. (1959). **Tsetse-fly tissue culture and the development of trypanosomes to the infective stage.**—Ann. trop. Med. Parasit. 53, 473-491. [Author's summary.] 2160

Initial outgrowths and long survival of several kinds of tissue from early pupae of *Glossina palpalis* occurred in a medium containing salts, sugars, lactalbumin hydrolysate, sheep serum and an extract of *G. palpalis* pupae.

Mitotic division was seen, even after 26 days in vitro, in a small clear elongate type of cell which grew out in some cultures of imaginal body-wall tissue from six-day-old pupae.

Several kinds of tissue differentiated and became motile in vitro.

Trypanosoma vivax was established in fly-tissue cultures by inoculating alimentary-tract and salivary-gland preparations with trypanosomes from a sheep with a long

standing chronic infection, and by incubating the cultures at 30–32°C.

Two sheep were infected with two different culture lines of *T. vivax* one after 39 days in vitro and the other after 16 days. Both the infective cultures had shown exceptionally active trypanosomes after 19 hours at 38°C.

Not all tissue cultures of *T. vivax* survived exposure for 19 hours to a temperature of 38°C. equally well. Some were completely killed by this treatment.

In the infective cultures of *T. vivax*, and in some which were not infective, there were present forms morphologically like metacyclic trypanosomes. Certain progressive changes in morphology were observed in the cultures.

T. brucei and *T. congolense* grew readily in the fly-tissue cultures, with the appearance of a variety of forms. *T. brucei* cultures after 19 hours at 38°C. showed some metacyclic forms but did not produce infections.

Honigberg, B. M. & Read, C. P. (1960). **Virulence transformation of a trichomonad protozoan.**—Science 131, 352–353. [Authors' abstr. modified.] 2161

Treatment of an avirulent strain of *Trichomonas gallinae* with a cell-free homogenate of a virulent strain enhanced its virulence as evidenced by the size of lesions produced in mice. Addition of deoxyribonuclease blocked the transformation.

Jayasuriya, D. J. C. (1959). **Some observations on balantidial infections in pigs, monkeys and slaughterhouse workers in Ceylon.**—Ceylon vet. J. 7, 34–37. [Author's summary modified.] 2162

The incidence of balantidiasis amongst animals is recorded for the first time in Ceylon.

A high incidence of *Balantidium coli*, 26% in pigs and 38.8% in monkeys and apes in a zoological garden in Ceylon, has been observed.

Hammond, D. M., Heckman, R. A., Miner, M. L., Senger, C. M. & Fitzgerald, P. R. (1959). **The life cycle stages of *Eimeria bovis* affected by the immune reaction in calves.**—Exp. Parasit. 8, 574–580. [Authors' summary modified.] 2163

In three experiments each using two groups of 4–6 calves, each calf in one group was given an immunizing inoculation of 60,000 to 100,000 oocysts, and after 30 to 35 days each calf in both groups was given a challenging inoculation of 800,000 to 5 million oocysts. One calf in each group was killed on successive days beginning 15 to 17 days after the

second inoculation. Numbers of schizonts in the small intestine were estimated by examination with a dissecting microscope and frequency of sexual stages in the caecum and colon was observed in sections. No consistent difference was found in concentration, estimated total number, or size of schizonts in the two groups, although non-immunized calves had a much higher frequency of sexual stages. The results indicate that the schizonts and preceding stages are not appreciably influenced by the immune reaction, so that immunity must chiefly affect the merozoites or sexual stages.

Cordero del Campillo, M. (1958). Estudios sobre *Eimeria falciformis* (Eimer, 1870), parásito del ratón. I. Observaciones sobre el período pre-patente, esporulación, morfología de los ooquistes y estudio biométrico de los mismos, producción de ooquistes y patogenicidad. [Studies on *Eimeria falciformis* infection in mice. I.]—An. Fac. Vet. Leon 4, 55–73. [Summaries in English and French.] 2164

An account of the shape and size of oocysts and sporocysts. The pre-patent period was 5 days.—R.M.

Burns, W. C. & Challey, J. R. (1959). **Resistance of birds to challenge with *Eimeria tenella*.**—Exp. Parasit. 8, 515–526. [Authors' summary modified.] 2165

Of 52 chickens each having one caecal pouch isolated from the digestive tract (technique described) and fistulated, a test group received an immunizing inoculation of *E. tenella* sporozoites through the fistula into the isolated pouch, the remainder being controls. About two weeks later the chickens in both groups were given sporulated *E. tenella* oocysts orally. The effects of the challenge infection in the two groups of birds were compared. In the controls it was characterized by a more pronounced and consistent reduction in body weight and r.b.c. volume when compared with the test birds. Differences in the gross pathological condition of the exposed caecum from birds in the two groups were sometimes apparent.

It is suggested that resistance to *E. tenella* is, at least in part, established by some generalized host response, and not limited to a local immunity at the site of the initial infection.

Joyner, L. P. (1960). **The relationship between toxicity and coccidiostatic efficacy of pyrimethamine and sulphonamides and their rela-**

tive reversal by folic acid.—Res. vet. Sci. 1, 2-9. [Author's summary modified.] 2166

Administration of 0.005% pyrimethamine in the food did not enhance the toxicity of sulphathiazole.

The presence of 0.005% sulphadiazine did not enhance the growth inhibiting effects of 0.004% pyrimethamine in the food.

The toxicity of pyrimethamine was quantitatively reversed by the simultaneous administration of folic acid.

25 m./kg. of folic acid daily reversed the growth-inhibition caused by 0.004% pyrimethamine plus 0.05% sulphadiazine in the food without reducing therapeutic efficacy against *Eimeria tenella* infections in chicks.

Rac, R. & Willson, R. L. (1959). **Globidiosis in sheep.**—Aust. vet. J. 35, 455-456. 2167

An outbreak of globidiosis (*G. gilruthi*) occurred in mature Merino wethers. Some showed oedematous swellings of the lips, cheeks and mandibular space, and some developed foetid diarrhoea. The abomasum showed diffuse reddening and thickening of the folds of the fundic region, with numerous whitish nodules, pin head in size, embedded in the mucosa. Similar nodules were present throughout the small intestine, and there were a few in the caecum. The nodules were full of crescent shaped non-motile bodies. The histology of the affected mucosa and the globidial cysts is described and illustrated. The cyst-like lesions contained the asexual stages of the parasite. Gametocytes which resembled coccidia were present in the small intestine, and in the faeces were numerous coccidia-like forms with a cap at one pole.—H. McL. GORDON.

Soliman, K. N. (1960). **Globidium infections in the Sudan with special reference to Globidium gilruthi (Chatton, 1910) in sheep and goats.**—J. Parasit. 46, 29-32. [Author's summary modified.] 2168

Globidium gilruthi infection in sheep and goats in the republic of the Sudan was recorded. Study of 665 cases over a period of 2 years showed that 32% of 425 sheep and 40% of 240 goats were infected. Cysts were observed in the abomasum in all the infected animals and in 57 sheep and 51 goats in the small intestines as well. The lesions caused by *G. gilruthi* are described.

Studdert, M. J. & Johnson, K. G. (1959). **Toxoplasma abortion and perinatal mortality in sheep.**—Aust. vet. J. 35, 502. 2169

Osborne [V.B. 30, 675] recorded genital

toxoplasmosis in sheep in New South Wales. Another occurrence is recorded here. After removal of a mummified foetus the cotyledons were seen to have white foci 1-3 mm. in diameter. Histological examination revealed toxoplasms in epithelial cells.—A. CULEY.

Fulton, J. D. & Turk, J. L. (1960). **Direct agglutination test for Toxoplasma gondii.**—Trans. R. Soc. trop. Med. Hyg. 54, 7-8. [Authors' abst. modified.] 2170

In this test a purified suspension of *T. gondii* from the peritoneal exudate of cotton-rats was used free from other cells (Fulton & Spooner, 1957). The parasites were suspended in buffered saline containing 1% formalin. To 0.4 ml. of the sera at the desired dilutions, in round bottomed tubes 3" x $\frac{1}{2}$ " which had been scrupulously cleaned with bichromate, was added 0.4 ml. of the suspension. The mixture was incubated for 2 hours at 37° and then left overnight at 2°C. Distinct agglutination patterns were formed on the bottom of the tubes and readings made with the aid of a mirror were classified as follows: thick ring, negative; thin ring and carpet, doubtful; carpet alone, weakly positive; carpet with granules and rolled edges, positive.

Jacobs, L., Remington, J. S. & Melton, M. L. (1960). **A survey of meat samples from swine, cattle, and sheep for the presence of encysted Toxoplasma.**—J. Parasit. 46, 23-28. [Authors' summary modified.] 2171

By a peptic digestion technique for concentrating parasites from large samples, a survey of *Toxoplasma* infection in diaphragm muscle from 50 pigs, 60 beef cattle, and 86 sheep was conducted. After digestion and washing, the sediment from the digests was inoculated into mice. *Toxoplasma* was isolated from 8 samples from pigs and 4 from sheep. In addition, 4 pork, 1 beef, and 4 mutton specimens produced dye test antibodies in the mice inoculated with them. The strains from pigs varied from low to high virulence; those from sheep were all of low virulence. *Sarcocystis* was found in 17 of 50 pigs and in nearly all the cattle and sheep.

The relation of these findings to the epidemiology of human toxoplasmosis and to the specificity of serological tests is discussed.

Lund, E., Lycke, E. & Hahn, E. (1960). **Stability of Toxoplasma gondii in liquid media.**—Acta path. microbiol. scand. 48, 99-104. [In English. Authors' summary modified.] 2172

The rate of inactivation of toxoplasma depended upon temperature. Death of infective parasites was studied by titration of plaque-forming units on chorioallantoic membranes of chick-embryos and by counts of parasites in dye tests. At 2°C. but not at 23° or 37° the parasite counts could be used as a parameter for loss of infectivity. Sera from different species inhibited the inactivation. This inhibiting property seemed bound to the serum proteins.

Simitch, T., Chibalitch, D., Pétrovitch, Z. & Heneberg, N. (1959). Contribution à la

connaissance de la faune des protozoaires intestinaux du porc de Yougoslavie. Leur identification expérimentale. [*Protozoal fauna of the intestines of pigs in Yugoslavia.*]—Arch. Inst. Pasteur Alger. 37, 401-408. 2173

Faeces samples from 1,800 pigs were examined and 9 species of protozoa were identified: *Iodamoeba* (in 156 pigs); *Endolimax* (in 188); a large *Entamoeba* (in 90); a small *Entamoeba* (in 55); *Trichomonas* (in 1,366); *Chilomastix* (in 47); *Tricercomonas* (in 36); *Balantidium* (in 1,282); and *Eimeria deblickei* (in 1,450). Their morphology and nomenclature are discussed.—T.E.G.R.

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Anon. (1959). **United Nations. Report of the sixth session of the European Commission for the control of foot-and-mouth disease. Rome, 7-9 April, 1959.**—pp. 62. Rome: Food and Agriculture Organization of the United Nations. (Meeting Report No. 1959/1). 2174

This report contains comments on the current position of F. & M. disease in Europe. There is also a report of visits to South American countries made by J. N. Ritchie, K. V. L. Kesteven and J. J. Hancock during 1958.—R.M.

Bazylev, P. M., Voinov, S. I. & Karpovich, M. B. (1960). [*Standard hyperimmune serum from rabbits for typing foot and mouth disease virus by complement fixation.*]—Veterinariya, Moscow 37, No. 1 pp. 33-35. [In Russian.] 2175

An account of the preparation of type-specific sera.—R.M.

Breese, S. S., Trautman, R. & Bachrach, H. L. (1960). *Analysis by electron microscopy and infectivity of foot and mouth disease virus in moving-boundary and zone ultracentrifugation.*—Arch. Biochem. 87, 1-8. 2176

Workers at the Plum Island Animal Disease Laboratory have previously described partial purification of the virus [*V.B.* 28, 3209]. This paper is concerned with the techniques involved in further purification and properties of the virus in the ultracentrifuge.

—R.M.

Lübke, A. (1959). Die Bedeutung körperlichen Trainings für die Ausbildung der durch das Maul-und-Klauenseuche-Virus hervorgerufenen Myokarditis. [*Effect of exercise on development of foot and mouth disease endocarditis in cattle.*]—Mh. Tierheilk. 11, 314-320. 2177

Mice were trained over a period of 6 weeks to swim to the point of exhaustion (up to 40 min.), which resulted in hypertrophy of the heart. They were then infected with F. & M. disease virus. After infection some were made to swim 4 times daily for 4 days: mortality, heart damage and multiplication of virus in heart muscle were greatest in these animals. The trained mice that did not swim after infection had lower mortality and less heart damage than untrained infected controls. L. suggested that the practical implication of this work was that cattle which had been out grazing were fitter and therefore less liable to develop heart damage upon infection than cattle permanently housed, providing that once F. & M. disease developed they were housed and kept strictly at rest.—W. K. DUNSCOMBE.

van Bakkum, J. G. (1959). Neutraliserende antistoffen in sera van tegen mond- en klauwzeer gevaccineerde runderen. [*Neutralizing antibodies in sera of cattle vaccinated against foot and mouth disease.*]—pp. 175. Wageningen: Centrum voor Landbouwpublikaties. [Versl. Landbouwk. Onderz. No. 658.] [In Dutch. Summaries in English, French and German.] 2178

Neutralizing antibodies were detected by a modification of the technique of Brooksby & Wardle [*V.B.* 24, 2699]. In the Netherlands all calves over two months old are immunized between February and April of each year. The author found that immunity would be better if the first inoculation of vaccine was given at 6-7 months of age. The relationship between antibody titre and resistance to challenge was studied.—R.M.

Lucam, F. & Fedida, M. (1960). Absence, chez le boeuf, d'une phase d'hypersensibilité

au virus aphteux, au cours de l'immunization antiaphteuse post-vaccinale. [**Absence of a phase of hypersensitivity to foot and mouth disease virus after inoculation of vaccine in cattle.**—C.R. Acad. Sci., Paris 250, 235-237. 2179

The occurrence of F. & M. disease 8-10 days after vaccination has been attributed to a "phase of hypersensitivity" or "negative phase of immunization". Challenge of cattle at various intervals after inoculation of 4 different vaccines with a sub-infective dose of virus failed to reveal the presence of hypersensitivity.—R.M.

Mackowiak, C., Lang, R., Fontaine, J. & Petermann, H. G. (1959). Technique de contrôle du vaccin anti-aphteux par séroneutralisation sur culture de tissu. [**Control of foot and mouth disease vaccine by serum neutralization in tissue culture.**—Ann. Inst. Pasteur 97, 571-582. [Summary in English.] 2180

Serum neutralization in kidney cell culture is considered practical and reliable for testing F. & M. disease vaccine. It is of value for the titration of antibodies in animals intended for use as controls; antibody titres for the 3 types of virus can be assessed; likewise, the development and duration of immunity and the effect of booster injections can be followed. The method is also of value in epidemiological studies and in the typing of viruses.—T.E.G.R.

Olechnowitz, A. F. (1959). Untersuchungen über die Abhängigkeit der Wirksamkeit von Adsorbatvaccinen gegen Maul- und Klauen-seuche von den Eigenschaften des Aluminiumhydroxyds. II. Mitteilung: Immunisierungsvermögen der Adsorbate. [**Dependence of the efficacy of adsorbed foot and mouth disease vaccine on the properties of aluminium hydroxide. II.**—Arch. exp. VetMed. 13, 944-952. [For Part I see V.B. 30, 397.] 2181

F. & M. disease vaccines were made using twelve different preparations of aluminium hydroxide. Providing they had a pH greater than 7, the preparations were of equal efficacy for vaccine production. Preparations having a pH of less than 7 were unsuitable for use in vaccines.—R.M.

Dinter, Z., Philipson, L. & Wesslén, T. (1960). **Properties of foot-and-mouth disease virus in tissue culture. II. Persistent infection induced by temporary exposure of the cultures to antibodies.**—Arch. ges. Virusforsch. 9, 582-593. [In English. Authors' summary modified.] 2182

By temporary exposure of calf kidney cultures infected with F. & M. disease virus to homologous antibodies a persistent infection was observed. The persistently infected cultures showed resistance to challenge with 100 TCD₅₀ of the virus strain used, for about 8-10 days after removal of antiserum, although persistent infection could be detected for an additional 10 days. The persistent infection could be cured by antibody and in fully developed persistently infected cultures every 200th-600th cell was infected with cytopathic virus.

Siebold, H. R. & Sharp, J. B., Jr. (1960). **A revised concept of the pathologic changes of the tongue in cattle with vesicular stomatitis.**—Amer. J. vet. Res. 21, 35-51. [Authors' summary modified.] 2183

A technique was devised to study the morphogenesis of lingual lesions of vesicular stomatitis in cattle.

These studies prompted a revised concept of the pathological changes of the tongue in cattle with vesicular stomatitis. The low percentage of vesiculation, as well as its transitory nature under controlled conditions of infection and observation, confirm clinical findings in recent field outbreaks of vesicular stomatitis in cattle.

Kuz'min, V. V. (1959). [**Dependence of the course of Aujeszky's disease in rabbits on the state of the central nervous system at the time of infection.**—Sborn. Rabot Leningrad. vet. Inst. 19, 45-48. [In Russian.] 2184

Rabbits whose nervous system had been depressed by means of chloral hydrate at the time of infection, lived longer than rabbits stimulated with caffeine at the time of infection.—R.M.

Munoz Davila, A. (1959). La rage bovine paralytique en Equateur. Détermination des types et étude de virus rabiques isolés. [**Paralytic rabies in cattle in Ecuador.**—Bull. Off. int. Epiz. 51, 877-899. [Summaries in English and Spanish.] 2185

Paralytic rabies was first reported in cattle in Ecuador in 1947. Outbreaks occur mainly in March, August and September, the proportion of affected cattle ranging from 0.5-10%. Vampire bats are thought to be the source of the infection. Dogs and other domestic animals are not affected during the outbreaks, although canine rabies has been endemic since 1941. Neutralization and cross

immunity tests in mice revealed no difference between 9 strains of virus from cattle, 2 from dogs, and fixed virus.—M.G.G.

Bell, J. F. & Moore, G. J. (1960). **Rabies virus isolated from brown fat of naturally infected bats.**—Proc. Soc. exp. Biol., N.Y. **103**, 140-142. [Authors' summary.] **2186**

Rabies virus has been isolated from brown fat of naturally infected *Eptesicus* and *Myotis* bats. In each case virus was present in very low infective concentration. Rabies virus was also isolated from brains of the same bats and from salivary glands of the *Eptesicus*.

Porterfield, J. S. & Allison, A. C. (1960). **Studies with pox viruses by an improved plaque technique.**—Virology **10**, 233-244. [Authors' summary modified.] **2187**

With chick embryo cell monolayers and an agar overlay containing tris (hydroxymethyl) aminomethane, well-defined plaques were obtained with vaccinia, cow pox, ectromelia, and herpes simplex viruses. The effects of variations in the composition of media are described. The titres obtained from plaque counts were of the same order as those obtained with chorioallantoic membrane pox counts. When incubated at 39° plaque formation with ectromelia was suppressed, but the number of plaques produced by vaccinia and cow pox was not significantly changed.

Kasel, J. A., Lieberman, R. & Smith, H. A. (1959). **Production of viral antibodies in ascitic fluid of mice.**—Virology **9**, 702-704. **2188**

A method of producing viral antibodies in mouse ascitic fluid is described. Groups of adult female mice received a series of i/m injections of 0.5 ml. undiluted influenza A/PR8, B/Lee, Cocksackie, Group B. types 1 and 5, and haemadsorption type 1 viruses. Further groups received suitable control inocula. Simultaneously, a series of i/p injections of a bacterial-adjuvant mixture was given which produced 2-20 ml. ascitic fluid per mouse, 15-31 days after the initial injection. Fluid and blood were then withdrawn from each group and respectively pooled for assay. The antibody titres in the ascitic fluid were similar to those in the serum and tables are given to support this finding.

—J. H. DARBYSHIRE.

Otta, J. & Jentsch, K.-D. (1960). **Spontane Infektion mit dem Virus der Bornaschen Krankheit bei Kaninchen. [Spontaneous**

Borna disease in rabbits.]—Mh. VetMed. **15**, 127-129. **2189**

An outbreak of Borna disease in tame rabbits was diagnosed by clinical and histological findings and c.f. tests. The virus was passaged in rabbits by intracerebral injection of infected brain suspension. Borna disease had occurred in horses in the vicinity in previous years.—M.G.G.

Levkovich, E. N. & Karpovich, L. G. (1960). **[Comparative study of viruses of the tick encephalitis group in cultures of HeLa cells.]**—Voprosy Virusologii **5**, 30-39. [In Russian. Summary in English.] **2190**

The 25 strains of viruses included 3 of louping-ill from Belorussia, one from the U.S.A. and one from the U.K.; also the agent of milk-borne diphasic fever from goat milk. —R.M.

Oki, Y. (1959). **Pathophysiological effects of circulating ferritin.**—Nature, Lond. **184**, Suppl. No. 25 pp. 1944-1945. **2191**

This work on ferritin obtained from the blood of horses with equine infectious anaemia has already been abstracted from the Japanese literature [*V.B.* **30**, 695].—R.M.

Ademollo, A. (1959). **Sur le danger de transmission de la peste bovine par les viandes importées. [Introduction of rinderpest by imported meat.]**—Bull. epiz. Dis. Afr. **7**, 91-95. [In French and English.] **2192**

The criticism that there was an error in diagnosis in the outbreak of rinderpest in Italy in 1918 caused by the importation of infected meat from Indonesia cannot be sustained as the diagnosis was made by two veterinarians with long experience of the disease. Although Scott asserts that rinderpest is transmitted by inhalation and that it can only occur where conditions are favourable for airborne dispersion of the virus, the classical view is that the alimentary canal is the natural portal of entry of the virus. It has been shown that meat can still be infective after 57 days' storage at -10°C., and that virus can be demonstrated in animals one month after vaccination and in the incubation period of the disease. In all vaccination campaigns, no matter how well organized, a percentage of animals escape vaccination. Before importation from enzootic areas is permitted, full information must be available; a joint OIE/FAO committee of experts should be set up to study the problem.—A. ACKROYD.

Larrat, R. (1959). Peste bovine et commercialisation des viandes. Une expérimentation nécessaire. [**Rinderpest as it affects export trade in meat.**]—Bull. epiz. Dis. Afr. 7, 87-90. [In French. Summary in English.] 2193

A surplus of cattle exists in French North-West Africa which cannot be exported because of restrictions on imports from rinderpest enzootic areas. L. suggested that neither the epidemiology of rinderpest, the methods of natural transmission of the disease, nor the duration of infection in chilled or frozen carcasses justifies some of this legislation and he claims that importation of meat from rinderpest enzootic areas is safe provided certain precautions are taken. The need for experiments to ascertain the danger of infection from contact with infected meat or meat from vaccinated animals has been stressed by the French Overseas Veterinary Service and was recommended by the 26th Session of the Office International des Epizooties. Experiments are now being undertaken at the Veterinary Research Laboratories at Dakar.

—A. ACKROYD.

Webster, R. G. & Manktelow, B. W. (1959). **Some observations on infectious bovine rhinotracheitis in New Zealand.**—N.Z. vet. J. 7, 143-148. [Authors' summary modified.] 2194

The isolation of infectious bovine rhinotracheitis virus from a cow with nasal catarrh, and the reproduction of a similar disease in susceptible cattle are described. Neutralizing antibodies have been found in sera from cattle in several widely separated areas of New Zealand. Two experimentally infected animals displayed nervous symptoms, and another two showed lesions in the adrenals, but no relationship between infectious bovine rhinotracheitis and bovine malignant catarrh has been shown.

Gillespie, J. H., Baker, J. A. & McEntee, K. (1960). **A cytopathogenic strain of virus diarrhoea virus.**—Cornell Vet. 50, 73-79. [Authors' summary modified.] 2195

From the spleen of a calf from Oregon whose signs of illness and lesions indicated virus diarrhoea, a cytopathic virus, designated Oregon C24V, was obtained and propagated in tissue-cultured bovine kidney cells. When inoculated into calves, this virus produced signs of illness similar to those produced by strain New York 1 of virus diarrhoea. Reciprocal cross immunity between Oregon C24V and New York 1 was demonstrated.

Preinoculation serum did not neutralize Oregon C24V virus in tissue culture, but

serum of calves after inoculation with either New York 1, Indiana 46, or Oregon C24V did.

Fernandes, M. V. (1959). **Cytopathogenic effects of bluetongue virus on lamb tissues in vitro.**—Tex. Rep. Biol. Med. 17, 94-105. [Author's summary modified.] 2196

Utilizing 3,960 primary explants in culture, the cytopathic effect on various tissues from new-born lambs of a strain of virus adapted to tissue culture was studied.

Cultures exposed to a low concentration of virus prior to being embedded in a plasma clot developed cellular changes that could be studied by phase contrast microscopy during 15 days following inoculation.

In cultures inoculated with 100 TCID₅₀/ml. of virus after the production of good cellular outgrowth a complete cytopathic effect was found within 6 days after inoculation.

No differences were observed in the susceptibility of various tissues, except that fibroblasts seemed to be more susceptible than epithelial elements. No specific lesions such as the formation of inclusion bodies, giant cells and syncytial masses were observed.

Mendlowski, B. & Segre, D. (1960). **Polyarthritis in sheep. I. Description of the disease and experimental transmission.**—Amer. J. vet. Res. 21, 68-73. 2197

Mendlowski, B., Kraybill, W. H. & Segre, D. (1960). **Polyarthritis in sheep. II. Characterization of the causative virus.**—Ibid. 74-80. [Authors' summary and conclusions modified.] 2198

I. An apparently new disease, polyarthritis of sheep, occurred in Wisconsin in Autumn 1957 and again in 1958. A virus-like agent was recovered from the joints and propagated serially in chick embryos. Susceptible lambs inoculated with the chick embryo-propagated virus developed a condition indistinguishable from the disease seen in the field. The causal agent seemed to belong to the psittacosis-lymphogranuloma group of viruses.

II. Similarities with viruses of the psittacosis-lymphogranuloma group included: elementary bodies, relative sensitivity to oxytetracycline and penicillin but not to streptomycin, pathogenicity for chick embryos and g.pigs and, more important, cross reaction with psittacosis c.f. antigen. Some differences were observed, notably the resistance of mice to experimental infection and destruction of c.f. antigen by phenol. More information is needed to decide whether sheep arthritis is caused by a new virus of the psittacosis-

lymphogranuloma group, or whether it is a hitherto undescribed manifestation of an already known virus.

Hoedemaker, L. (1959). Het probleem "varkenspest". [**Incidence and control of swine fever in the Netherlands.**].—Tijdschr. Diergeneesk. 84, 1501-1524. Discussion: pp. 1525-1529. [In Dutch. Summaries in English, French and German.] 2199

H. reviewed incidence (with the aid of 13 tables or graphs) between 1937, when the disease was first made notifiable, and 1958. Between 1943 and 1951 there were only between 3 and 104 outbreaks a year but in 1952 there was a sharp increase to 3,060 outbreaks while between 1953 and 1958 the numbers ranged from 447 to 1,363. The 1952 epidemic was attributed to spread of infection from Germany. Losses between 1955 and 1958 were assessed at between 1 and 3 million florins a year. Compulsory inoculation of all 6 million pigs with crystal violet vaccine was out of the question because this would cost 8-10 million florins a year. Affected herds were isolated but infected pigs were not slaughtered. Improvement in control could be achieved by better measures to prevent spread of the disease and by more rapid diagnosis. The possible applications of rabbit-adapted virus vaccine were discussed.—R.M.

Dräger, K., Kamphans, S. & Kosch, W. (1960). Über die Anwendung des Antigens nach Sarnowicz als diagnostisches Hilfsmittel bei der Schweinepest. [**Antigen prepared by Sarnowicz's method in the diagnosis of swine fever.**].—Tierärztl. Umsch. 15, 82-86. 2200

Antigen prepared from formalized blood and castor oil by the method of Sarnowicz (1934) was injected i/d and the reaction was read 24 hours later. A red or bluish-red spot more than 20mm. diameter was regarded as positive, and a red spot less than 20 mm. negative. All of 7 pigs infected 4 days previously and 22 of 33 pigs in a naturally infected herd were positive. Immunized pigs tested 3-4 days after challenge were usually positive, but 20 weeks after challenge they were not.—M.G.G.

Drăghici, D., Grecianu, A. & Cîrsteș, I. (1959). Studiul modificărilor anatomice și histologice ale vezicii biliare ductului cistic și ficatului la porcii sănătoși și bolnavi de pestă porcină. [**Histological changes in the gall bladder and bile duct of apparently healthy pigs and pigs with swine fever.**].—Lucr. Inst. Pat. Igiena anim., București 9, 271-283. [In

Roumanian. Summaries in French and Russian.] 2201

A common finding in apparently healthy pigs was hyperplasia of lymphoid follicles in the mucosa of the bile duct and gall bladder, which the authors named chronic follicular colicystitis. A varied microflora was isolated from the gall bladder. Lesions encountered in swine fever were not specific and were similar to those described by Bulgarian workers [*V.B.* 25, 3543].—R.M.

Biró, J. & Markovits, P. (1960). **Experimental studies on the propagation of swine fever virus in tissue culture. IV. Virulence and antigenicity of mass cultures of swine fever virus in tissue culture.**—Acta vet. Acad. Sci. hung. 10, 23-26. [In English.] 2202

An account in English of work previously abstracted [*V.B.* 30, 420].—R.M.

Malmquist, W. A. & Hay, D. (1960). **Hemadsorption and cytopathic effect produced by African swine fever virus in swine bone marrow and buffy coat cultures.**—Amer. J. vet. Res. 21, 104-108. [Authors' summary modified.] 2203

Pig bone marrow and buffy coat cells were cultured on a glass substrate, using 80% mixture 199 and 20% pig serum as medium.

African swine fever (ASF) virus infected certain large granular cells (macrophages) and produced two distinct reactions—haemadsorption followed by cytolysis. Fibroblast-like cells were not involved and continued to proliferate in infected cultures.

It is believed that the reactions are specific for differentiation of ASF from classical swine fever virus. ASF virus from different sources was used as inoculum; adaptation was not necessary and all strains produced identical reactions.

The time required for the appearance of a haemadsorption reaction depended upon the titre of the virus. As little as 0.05 ml. of infective blood collected during the acute phase gave positive results in 24 hours or less.

The results of titration of material containing ASF virus were comparable in bone marrow and buffy coat cell cultures; however, the latter were easier to prepare.

Serum from survivor-carriers inhibited the haemadsorption reaction but did not neutralize the cytopathic effect to a significant degree. It is believed that the antigen responsible for haemadsorption is distinct from the infective particle.

Brauner, P. (1960). Studie bakteriálního antagonismu proti viru infekční obrny prasat. [Antagonism between certain bacteria and Teschen disease virus.]—Sborn. čes. Akad. zemědělsk. Věd, vet. Med. 5, 11-26. [In Czech. Summaries in English and Russian.] 2204

Porcine encephalomyelitis virus does not survive in pig dung for more than 8-25 days. *Escherichia coli*, *Sarcina lutea*, *Flavobacterium ochraceum*, *Staphylococcus albus*, *Proteus vulgaris*, *Bacillus mesentericus*, *B. mycoides* and *Pseudomonas pyocyanea*, isolated from pig dung, had no marked effect on the virus in a 20% brain-cord suspension. It was concluded that the virus was killed by putrefaction by-products and not by the action of these bacteria.—E.G.

Menšík, J. (1959). Další poznatky o intrauterinní infekci a dlouhodobém přežívání viru prasat v organismu infikovaných selat a prasnic. [Intra-uterine infection and persistence of swine influenza virus in the organism of infected piglets and sows.]—Sborn. čes. Akad. zemědělsk. Věd, vet. Med. 4, 797-806. [In Czech. Summaries in German and Russian.] 2205

Swine influenza virus persisted in the lungs of infected piglets for up to 135 days. Transplacental transmission was demonstrated by infection of pregnant sows and resulted in abnormalities in foetuses. The virus was recovered from lungs and other organs of newborn piglets. In young of the first litter infection was more severe than in subsequent ones. Neither haemagglutination-inhibiting nor virus-neutralizing antibodies, demonstrable even in first litters, nor colostrum appeared to afford protection.—E.G.

Betts, A. O. (1960). Studies on enteroviruses of the pig. I. The recovery in tissue culture of two related strains of a swine polio-encephalomyelitis virus from the tonsils of 'normal' pigs. II. The effect of temperature, ultra-violet light and ether on the T 80 strain of a swine polio-encephalomyelitis virus.—Res. vet. Sci. 1, 57-64 & 65-71. 2206

Jennings, A. R. & Kelly, D. F. (1960). Studies on enteroviruses of the pig. III. Cellular lesions in cultures of pig kidney epithelium induced by a swine polio-encephalomyelitis virus.—Ibid. 72-75. [Authors' summaries modified.] 2207

I. Viruses, designated T 80 and T 52A, were recovered from the tonsils of two 'normal' bacon pigs and the faeces of one of them.

Both strains produced polio-encephalomyelitis when inoculated into pathogen-free piglets deprived of colostrum. Both strains caused cytopathic changes in pig kidney monolayers similar to those induced in monkey kidney cells by human poliovirus. The titres reached in infected tissue culture fluids were of the order of 10^6 TCID₅₀ per ml. The size of the virus as determined by filtration through gradocol membranes was about 30 ml.

II. The resistance of the T 80 strain of a swine polio-encephalomyelitis virus to heating, ultra-violet light and ether was investigated using infected tissue-culture maintenance fluids containing 5% bovine serum.

In each of 2 experiments 99% of the virus was inactivated within 30 sec. by heating to 65°C. and 99-9% in less than 1 min., but some virus resisted heating to this temperature for 2 min. In one experiment 99% of the virus was inactivated within 2 hours by heating to 56°C. and 99-9% in approximately 3.5 hours, but some virus remained alive after 9 hours' heating. In a second experiment 99% of the virus was destroyed in about 1 hour and 99-9% in approx. 2 hours, but a fraction withstood heating for 8 hours. At room temp. some virus survived for 150 days, and there was no fall in titre of virus kept at +4°C. for 178 days. There was no appreciable reduction in titre of virus kept at -70°C. for 449 days. When the virus-containing fluids were exposed (in layers less than 0.3 mm. in depth) to ultra-violet light (wavelength 2537 Å, intensity 99 watts per sq. cm.) 99% of the virus was inactivated in a little over 1 min. and 99-9% in just 2 min., but 12 min. exposure was necessary for complete inactivation. Exposure to ether for 18 hours at +4°C. caused no diminution in titre.

III. A description is given of the cellular changes induced in tissue culture by a porcine enterovirus. These changes differed from degenerative changes in control sheets of cells in their extent and in their distribution. The degenerative changes in infected cultures terminated in the death of cells and in the destruction of the cell sheet. The cytoplasmic alterations included increased granularity and the appearance of acidophilic masses and cytoplasmic processes. Nuclear changes included condensation of the chromatin, wrinkling of the nuclear membrane and eccentricity of the nucleus with, finally, pyknosis.

Bohl, E. H., Singh, K. V., Hancock, B. B. & Kasza, L. (1960). Studies on five porcine

enteroviruses.—Amer. J. vet. Res. 21, 99-103. [Authors' summary modified.] 2208

Five antigenically different viruses have been isolated from the faeces of pigs, using tissue cultures of pig kidney cells.

Four of these viruses produced distinctly different types of plaques.

Two antigenically different, but related, viruses produced indistinguishable plaques.

It is proposed that these viruses be called ECPO (enteric cytopathogenic porcine orphan) viruses, followed by a number indicating the antigenic type.

No disease in pigs has yet been associated with these viruses, although this aspect has not yet been pursued.

None of these five viruses has been identified with any previously known virus, although this possibility has not been thoroughly explored.

Arakawa, S., Muto, S., Kaneko, T. & Seki, T. (1959). **Experimental studies on canine distemper virus (CDV). Report 1. Experiment on the isolation of the virus in mice and embryonated eggs and the relation of the mouse-adapted CDV to mouse-fixed measles virus and others.**—Yokohama med. Bull. 10, 179-189. [In English.] 2209

Three field strains of distemper virus were adapted to mice and also to chick embryos and they were compared with Strain J that had been adapted to mice in 1953. It was confirmed that the virus associated with "hard pad disease" was typical distemper virus. There was cross-neutralization between distemper and measles virus but not between distemper and equine infectious anaemia, fowl pox, human virus hepatitis and others.

—R.M.

Piercy, S. E. & Sellers, R. F. (1960). **Antibody response to a combined living attenuated distemper/hepatitis vaccine.**—Res. vet. Sci. 1, 84-93. [Authors' summary modified.] 2210

A trial with a combined living vaccine containing the Beckenham egg embryo-adapted strain of Onderstepoort attenuated canine distemper (CD) virus and the Cornell strain of pig kidney-adapted canine contagious hepatitis (CCH) virus is described. Effects of vaccination, development of antibodies and resistance to challenge were studied in groups of dogs given undiluted and serial dilutions of vaccine.

Neutralizing antibodies were demonstrated in many cases by the second week after inoculation. They reached a high level in dogs receiving the larger doses of vaccine.

In-contact dogs remained clinically healthy, although the attenuated CCH virus was evidently excreted, since these dogs all developed CCH antibodies except the one in contact with the group receiving the highest dilution of vaccine.

Whereas all dogs that developed specific neutralizing antibodies resisted challenge, non-immunized dogs in the higher vaccine dilution groups and the controls reacted with varying degrees of severity, and some died.

The immunizing dose of the CD component was about 1,000 EID₅₀, and of the CCH component less than 2 TCID₅₀.

Histological examinations of livers and kidneys revealed no evidence of damage despite vaccination with large amounts of attenuated virus followed by challenge with virulent virus.

Holt, D. (1959). **Presence of K-virus in wild mice in Australia.**—Aust. J. exp. Biol. med. Sci. 37, 183-191. 2211

A virus which caused fatal pneumonitis in unweaned mice was isolated from mice in Brisbane. It was indistinguishable immunologically and histopathologically from the K-virus reported from America by Kilham & Murphy in 1953 [Proc. Soc. exp. Biol., N.Y., 82, 133]. Unweaned mice died 12 to 15 days after i/p inoculation. Lesions were confined to the pleural cavity; the lungs were plum coloured and there were pleural effusions. The endothelial cells lining the small arterioles and capillaries of the lungs contained intranuclear inclusions. Mice older than 10 days were resistant, but adult mice were carriers and the disease was enzootic in the infected population.

—N. WICKHAM.

Iwashina, K. (1959). **Experimental studies on the modification of fowl pest virus (China strain) and Newcastle disease virus (Sato strain) and active immunization with the modified living viruses. I. Infectivity of fowl pest virus to guinea pigs.**—Jap. J. vet. Sci. 21, 265-280. [In English. Summary in Japanese.] 2212

Intracerebral or intraperitoneal inoculation of g.pigs with chicken brain or spleen emulsions containing the Chiba strain of fowl plague virus caused no clinical symptoms, but all animals inoculated with spleen emulsion died and the virus was demonstrated in the brain by chorioallantoic membrane inoculation. Mouse-adapted virus was recovered from the brains of all inoculated g.pigs irrespective of the route of inoculation and occasionally from

the spleen and lungs and after serial passage caused nervous symptoms. The incubation period was 5-7 days. Mouse-adapted virus passaged through g.pig intraperitoneally appeared slightly less virulent for chickens.

—A. ACKROYD.

Piraino, F. P. & Hanson, R. P. (1960). **An in vitro method for the identification of strains of Newcastle disease virus.**—*Amer. J. vet. Res.* 21, 125-127. [Authors' summary modified.] 2213

Suspensions of chick embryo brain cells were found to adsorb all the haemagglutinating activity of some strains of Newcastle disease virus and to leave the haemagglutinating activity of the other strains unaffected. Pathogenicity of strains of N.D.V. appears to be related to the avidity of the virus for brain cells. The procedure described can be used to study the nature of pathogenicity and can also be used in the identification of strains of the virus.

Lancaster, J. E., Merriman, M. & Rienzi, A. A. (1960). **The intranasal Newcastle disease vaccination of chicks from immune parents.**—*Canad. J. comp. Med.* 24, 52-56. [Authors' abst. modified.] 2214

A study was made of the influence of passive immunity on the haemagglutination-inhibition response following the intranasal vaccination of 2 groups of chicks. Chicks from the same hatch were non-vaccinated controls.

No detectable immune response followed the first vaccination at two days of age. A second vaccination at 58 days of age also failed to produce an appreciable increase in serum H-I titres. The third vaccination at 108 days of age resulted in an immediate and significant increase in H-I titres.

In the absence of challenge with virulent virus these results cannot be assessed with accuracy.

Jansen, J. & Richter, J. (1959). **Erfahrungen mit der infektiösen Bronchitis und ihrer Bekämpfung in den Niederlanden. [Control of infectious bronchitis in the Netherlands.]**—*Arch. Geflügelk.* 23, 429-439. [Summary in English.] 2215

The authors discussed the difficulty of differentiating between infectious bronchitis (IB) and Newcastle disease, and described a live attenuated vaccine against bronchitis. The recommended immunization procedure in the Netherlands was: combined inoculation against IB and ND at 3 weeks of age; second

inoculation against ND at 3 months, followed by IB vaccine 3 weeks later; vaccination against fowl pox at 4½-5 months of age.

—R.M.

Hanson, R. P., Filmer, D. L. & Quiroz, C. (1960). **Properties of Fahey-Crawley virus.**—*Avian Diseases* 4, 79-85. [Authors' summary modified.] 2216

The virus isolated in 1954 by Fahey & Crawley from fowls with chronic respiratory disease differed from other avian viruses in its pathogenicity for fowls and chick embryos, its poor antigenic properties and its firm physico-chemical stability. Electron microscopy revealed a particle size of 390Å. This was much smaller than other avian viruses capable of producing plaques on the allantoic membrane.

I. Snoeyenbos, G. H., Basch, H. I. & Sevoian, M. (1959). **An infectious agent producing hepatitis in turkeys.**—*Avian Diseases* 3, 377-388. 2217

II. Mongeau, J. D., Truscott, R. B., Ferguson, A. E. & Connell, M. C. (1959). **Virus hepatitis in turkeys.**—*Ibid.* 388-396. [Authors' summaries modified.] 2218

I. An acute infectious, apparently highly contagious, hepatitis has been recognised in turkey poults in Massachusetts. The agent, probably a virus, is readily cultivated in the yolk sac of chick embryos; it passes through a 0.3 µ Millipore filter and appears unaffected by antibiotics. Focal degenerative hepatitis occurs in affected poults which may also develop hepatic congestion or haemorrhage and degenerative changes in the pancreas. Chicks were refractory to the agent.

II. An outbreak of hepatitis causing high mortality in turkey poults under two weeks of age was investigated in Ontario in spring 1958.

An infectious agent was isolated from the liver by yolk-sac inoculation of chick embryos.

The condition was reproduced in day-old poults by inoculating infective yolk or liver suspension into the unabsorbed yolk sac. Small grey necrotic foci appeared on the liver within 7 days. Macroscopic examination revealed no other affected organs.

Aerobic and anaerobic cultures for bacteria and PPLO were negative. Filtration trials indicated that the agent was less than 300 mµ in size. It was resistant to penicillin, streptomycin and tetracycline. The effect of other chemotherapeutic agents is being studied.

Kalter, S. S. (1960). **Animal "orphan" enteroviruses.**—Bull. World Hlth Org. 22, 319-337. [Summary in French. Abst. from author's summary.] 2219

The author reviewed the information at present available on the occurrence of the so-called "orphan" enteroviruses in monkeys, cattle, pigs, and other animals in various parts of the world, and discussed the possible inter-relationships of these animal viruses with each other and with the human enteroviruses.

Noice, F., Bolin, F. M. & Eveleth, D. F. (1959). **Incidence of viral parotitis in the domestic dog.**—J. Dis. Children 98, 350-352. 2220

Swelling of the parotid glands was seen in two puppies aged 6 and 3 months. Both cases occurred during outbreaks of mumps in the households. Viruses isolated from saliva of the dogs possessed properties similar to those of mumps virus.—R.M.

Jadin, J., Thomas, J. & Léonard, J. (1959). **Fréquence des anticorps agglutinant Rickettsia burneti dans l'avortement des bovidés en Belgique. [Antibodies against Rickettsia burneti in aborting cattle in Belgium.]**—C. R. Soc. Biol., Paris 153, 1881-1882. 2221

In Belgium *Br. abortus* accounted for a third of abortions in cows. 169 sera from

cases not due to brucellosis were tested by the slide agglutination test for *R. burneti* and 107 were positive.—R.M.

Zarnea, G., Alexandrescu, N., Szeqli, L., Voiculescu, R., Dinculescu, M., Ionescu, H. & Perederi, S. (1959). **Occurrence of Coxiella burneti in a hedgehog (Erinaceus europaeus Linné) captured in an endemic-zootic area of "Q" fever.**—Arch. roum. Path. exp. Microbiol. 18, 83-88. [In English. Summaries in French, German and Russian.] 2222

Rickettsia burneti was isolated from one of 13 hedgehogs captured near a farm with endemic Q fever.—M.G.G.

Dawson, F. W., Janssen, R. J. & Hoffman, R. K. (1960). **Virucidal activity of beta-propiolactone vapor. II. Effect on the etiological agents of smallpox, yellow fever, psittacosis, and Q fever.**—Appl. Microbiol. 8, 39-41. [Authors' summary modified.] 2223

The results presented show that a 15-min. exposure to a concentration of 1 mg. or more of β -propiolactone per litre of air is sufficient to inactivate the viruses of smallpox, yellow fever, psittacosis, and *Rickettsia burneti*. This activity against a variety of viruses which differed in morphology, pathogenicity, and relative stability suggests that the vapour is a general viral and rickettsial disinfectant.

See also abst. 2424 (book, infectious diseases of domestic animals).

IMMUNITY

Hubinont, P. O., Ghysdael, P. & Thys, O. (1959). **Production of an agglutinating auto-antibody (panagglutinin) active upon tanned erythrocytes in the rabbit.**—Nature, Lond. 184, Suppl. No. 16 1250-1251. 2224

Rabbit erythrocytes treated with tannic acid were suspended in saline with 1% normal rabbit serum (no explanation is offered for the addition of this serum) and coated with human gamma globulin. These cells injected i/v into rabbits induced high titre anti-human globulin antisera and also specific iso-agglutinins against rabbit blood group antigens. One of the rabbits also developed an auto-agglutinin (panagglutinin) active on tanned rabbit erythrocytes.—W. E. PARISH.

Fesce, A. (1959). **La titolazione della properdina nella specie bovina. [Determination of properdin in serum of cattle.]**—Arch. Vet. Ital. 10, 519-527. [Summaries in English, French and German.] 2225

Determination of properdin in cattle

serum by the method described by Pillemer is difficult owing to the presence of congenitins. A modification is described which eliminates this difficulty by avoiding the addition of Ca ions to the system. This is achieved by using veronal buffer deprived of Ca ions and the Ca ions in serum and in properdin-deficient serum (RP) are eliminated by using a chelating substance. Properdin and zymosan react in the absence of Ca ions and in the presence of Mg ions without interference from congenitins. The properdin-zymosan complex is first obtained at 17° and an assessment is then made of its ability to inactivate at 37° the C₃ contained in the RP.—T.E.G.R.

Gledhill, A. W. (1960). **Some aspects of non-specific resistance to infectious diseases.**—Vet. Rev. Annot. 6, 27-37. 2226

G. discussed the parts played by phagocytosis by the reticuloendothelial system, by properdin, bacterial endotoxin and other factors.—R.M.

Anon. (1960). The 1959 Fort Detrick Symposium on "Nonspecific resistance to infection", held at Hood College, Frederick, Maryland 16 and 17 September 1959. [Sponsored by the U.S. Army Chemical Corps, Fort Detrick.]—Bact. Rev. 24, 1-200. 2227

The March issue of *Bacteriological Reviews* comprises 16 papers on the various factors responsible for non-specific immunity, such as phagocytosis, viral and bacterial interference, nutrition, genetics, hormones and cellular immunity.—R.M.

Porter, K. A. (1960). Runt disease and tolerance in rabbits.—Nature, Lond. 185, 789-790. 2228

Many unborn rabbits inoculated i/p on the 20th or 22nd day of gestation with spleen cells from an adult rabbit developed tolerance to skin grafts from the donor and some developed runt disease, a syndrome characterized by wasting, lymphoid atrophy, premature death and sometimes immune haemolytic anaemia. Rabbits inoculated i/p on or after the 26th day of gestation or i/v 1-4 hours after birth rejected grafts from the donor

more quickly than from other rabbits. Spleen cells injected on the 24th day, however, induced neither tolerance nor immunity to homografts.—M.G.G.

Burnet, F. M. (1959). Auto-immune disease. I. Modern immunological concepts. II. Pathology of the immune response.—Brit. med. J. October 10th, 645-650, & October 17th, 720-725. 2229

A theoretical study of the relation of the clonal selection concept of immunologically competent cell to auto-immune disease. Two clinical examples are cited as evidence that somatic cells mutate in a manner similar to that of germ cells. Acquired haemolytic anaemia and disseminated lupus erythematosus with other conditions of the collagen disease complex are used as models of disease resulting from auto-immunization

—W. E. PARISH.

Hall, J. G. (1959). Blood grouping in domestic animals.—Vet. Rec. 71, 1062-1067. D's cussion: pp. 1067-1070. 2230

A general discussion with no new information.—R.M.

See also absts. 2065 (cf. test in Johne's disease); 2074 (vaccine against Johne's disease); 2076 (effect of hyaluronidase on swine erysipelas serum); 2106-2122 (brucellosis); 2129 (active immunization against blackleg and malignant oedema); 2148 (indirect haemagglutination and haemagglutination-inhibition with mycoplasma mycoides); 2150 (pleuropneumonia); 2163 (life cycle of *Elmeria bovis* affected by immune reaction in calves); 2170 (direct agglutination test for toxoplasma); 2175-2182 (F. & M. disease); 2183 (virus antibody production in ascitic fluid of mice); 2200 (swine fever); 2210 (distemper-hepatitis vaccine); 2212 (fowl plague); 2214 (Newcastle disease); 2221 (Q fever antibodies in aborting cattle).

PARASITES IN RELATION TO DISEASE [GENERAL]

Antipin, D. N., Ershov, V. S., Zolotarev, N. A. & Salyaev, V. A. (1959). [Parasitology and invasive diseases of farm animals.]—pp. 492. Moscow: Gosud. izdatel'stvo sel'skokhoz. literatury. 2nd edit. [In Russian.] 2231

This Russian textbook for veterinary students covers in some detail helminths, arthropods and protozoa and the diseases caused by them in farm animals. Russian and Latin indexes provide a guide to Russian scientific terms that may be missing from ordinary dictionaries. It costs 15s. in the U.K.—R.M.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Baumhover, A. H., Husman, C. N., Skipper, C. C. & New, W. D. (1959). Field observations on the effects of releasing sterile screw-worms in Florida.—J. econ. Ent. 52, 1202-1206. [Authors' abst. modified.] 2232

Approximately 500 sterile male *Callitroga hominivorax* flies were released weekly per square mile over an area of 2,000 sq. miles. The insects had been irradiated as pupae, within 2 days of adult emergence, with 6,200 to 8,300 r gamma rays from cobalt-60. Flies were distributed daily in 6-mile swaths by aircraft. Shifting of flight lanes resulted in the area being covered in 1-mile swaths weekly.

Egg-mass collections in the treated area declined from a weekly average of 41 per station during the first 2 months to 11 in the 12th week. Check stations recorded a continuing high population north of the treated area but a decline on the west and south. However, at the end of 3 months 70% of the egg masses were sterile.

Nardi, E. & Lellis, M. (1960). Esperimento di profilassi dell'ipodermosi bovina con un estere fosforico ("Neguvon") impiegato per via orale. [Oral administration of Neguvon for the control of warble fly in cattle.]—

Vet. ital. 11, 24-33. [Summaries in English, French and German.] 2233

In 10 calves treated with Néguvon (Dipterex) by the oral route (3 doses at monthly intervals during December-January) there were 18 parasitic nodules, as compared with 286 in 10 untreated controls. Some of the test animals did not tolerate the drug well and it is considered that this method of control is not practicable on a large scale.—T.E.G.R.

Kohler, P. H., Rogoff, W. M. & Duxbury, R. (1959). **Continuous individual feeding of systemic insecticides for cattle grub control.**—J. econ. Ent. 52, 1222-1223. 2234

Calves were given in their feed 1-6 g. daily of one of the following:—ronnel (Dow ET-57), nicarbazin, S.D. 51 [9-aminoacridine HCl], or S.D. 75 [2-(p-nitrobenzamido)-5-nitrothiazole]. There was some difficulty in getting the calves to take the treated feed. The chemicals were fed for 77-84 days, except for one 7 day trial with ronnel. Ronnel gave almost complete warble control after only 7 days' feeding of 6 g. daily; the other chemicals were unsatisfactory.—W. N. BEESLEY.

Raun, E. S. & Herrick, J. B. (1960). **Organophosphate systemics as sprays and feed additives for cattle grub control.**—J. econ. Ent. 53, 125-126. [Authors' abst. modified.] 2235

Ronnel (Dow ET-57, Trolene, or Korlan) was administered to steers in the feed: 15 mg./kg./day for 7 days, and 25 mg./kg./day for 6 days. Bayer 21/199 was sprayed as a 0.5% suspension or emulsion at 250 lb. pressure. There was no difference in warble control, weight gain, feed efficiency or carcass grades between treatments. Warble control ranged from 76 to 99%.

Drummond, R. O., Jackson, J. B., Gless, E. E. & Moore, B. (1959). **Systemic insecticides for the control of *Gasterophilus* bots in horses.**—Agric. Chemic. 14, No. 12 pp. 41-43 & 100. [Authors' summary modified.] 2236

To determine effectiveness of 8 systemic insecticides against *Gasterophilus nasalis* and *intestinalis*, horses were treated by stomach tube, by adding insecticides to feed, or by intramuscular injection. Co-Ral, Dowco 105, ronnel (Trolene grade), and dimethoate failed to expel bots. Dowco 109 by stomach tube was partially effective. Ruelené was effective at 100 mg./kg., dichlorvos (DDVP) at 50 mg./kg. by stomach tube and at 50 and 25 mg./kg. in feed, and Dipterex at 100 and 75 mg./kg. by

stomach tube and 75-25 mg./kg. in feed. Ruelené and DDVP by stomach tube were toxic to the horses at effective dosages. Dipterex was toxic at 100 mg./kg. by stomach tube, but non-toxic in lower doses by stomach tube and in feed. With Dipterex, treatment in feed was more effective than by stomach tube; the two species of bots seemed equally susceptible. Dipterex injected i/m at 25 mg./kg. was partially effective against both species. Dipterex in feed at 37.5-40 mg./kg. appeared to be a safe and practical treatment.

Murnaghan, M. F. (1960). **Conduction block of terminal somatic motor fibres in tick paralysis.**—Canad. J. Biochem. Physiol. 38, 287-295. [Abst. from author's summary.] 2237

The mechanism of the paralysis is probably due to an inability of the nerve impulse to traverse the terminal presynaptic fibres. The 'lesion' evidently extends to the end of the presynaptic fibre, i.e., more distally than in botulism, because direct stimulation of the tick-paralysed muscle fails to liberate acetylcholine.

I. Sal'nikov, N. P. (1959). [Nichloran, a new parasiticide emulsion composed of BHC, nicotine and transformer oil.]—Trudy Vsesoyuz. Inst. vet. Sanit. i Ektoparasit. 14, 16-19. [In Russian.] 2238

II. Kurmanov, I. A. (1959). [Parasiticide properties of nicochloran.]—Ibid. 19-20. [In Russian.] 2239

III. Priselkov, A. M. & Polyakov, D. K. (1959). [Toxicity of nicochloran.]—Ibid. 20-24. [In Russian.] 2240

IV. Kurmanov, I. A. (1959). [Toxicity of nicochloran for cattle.]—Ibid. 24-29. [In Russian.] 2241

I. Fowl houses were rid of mites by spraying with Nicochloran, an aqueous emulsion of nicotine salts, turpentine and transformer oil, containing 0.5% BHC. Lice were eradicated by spraying or dipping fowls in 0.1-0.2% BHC emulsion. 150 ml. of a 1.3% PHC emulsion rubbed 2 or 3 times on the back of 12,400 cattle killed all warbles, and application of a 0.2-0.3% BHC emulsion killed ticks. Flies, cockroaches and other insects were eradicated by spraying their breeding places.

II. Nicochloran, containing 0.2% BHC, applied to wooden boards at the rate of 200 ml. per square metre killed all *Musca domestica* for 2 months, but on cloth the effect lasted only 10 days. On bricks treated at the rate of

50 ml. per 100 sq. cm. it remained lethal for over 100 days. On metal surfaces the maximum effect lasted 20 days. Nicochloran containing 0.2% BHC applied to boards killed all *Rhipicephalus bursa* for 9 days, containing 0.5% BHC it remained lethal for *Rh. bursa* on soil for 20 days and on calves for 15 days (500 ml. per calf).

III. Nicochloran containing 0.4-0.8% BHC (2-4 litres) or 2.25% BHC (200 ml.) rubbed onto the skin of cattle was highly toxic and sometimes fatal. Containing 0.3% BHC (2 litres) it was slightly toxic and containing 0.2% BHC it had no effect.

IV. A litre of Nicochloran containing 0.2 or 0.3% BHC caused no signs of toxicity when sprayed on to each of 2 calves every fourth day in 25 days, but did when rubbed on. A litre containing 0.5% BHC caused slight symptoms when sprayed on but fatal intoxication when rubbed in.—M.G.G.

Knapp, F. W. & Krause, G. F. (1960). **Control of the northern fowl mite, *Ornithonyssus sylviarum* (C. & F.), with ronnel, Bayer L13/59 and Bayer 21/199.**—J. econ. Ent. 53, 4-15. [Authors' abst. modified.] 2242

600 fowls were used to test Bayer 21/199 as 0.5 and 0.25% dusts and Bayer L13/59 and ronnel as 1% dusts, applied to individual birds on four body areas and the rate of 3 to 4 g. a bird. Each gave satisfactory control up to 28 days after treatment and virtually eradicated the mites if no birds were left untreated. No

detectable residue could be found in the eggs of hens treated with Bayer 21/199 or ronnel and no off-flavour of eggs was detected.

Bigley, W. S., Roth, A. R. & Eddy, G. W. (1960). **Laboratory and field tests against mites and lice attacking poultry.**—J. econ. Ent. 53, 12-14. [Authors' abst. modified.] 2243

In laboratory tests against the northern fowl mite *Ornithonyssus sylviarum*, ronnel (Korlan) was more toxic than malathion or barthrin. In spray tests on infested birds, dicapthion and ronnel were more effective than malathion, barthrin, or diethyltoluamide. *Dermanyssus gallinae* was far more difficult to kill. In field tests on turkeys infested with *O. sylviarum* and on chickens infested with the body louse *Menacanthus stramineus*, excellent results were obtained with both ronnel and malathion.

Behrenz, W., Federmann, M. & Bolle, W. R. (1959). **Experimentelle Arbeiten mit Ektoparasiten der Schafe. Bekämpfung und Verhütung des Ektoparasitenbefalles bei Schafen mit Asuntol und Neguvon im Dipverfahren. [Control and prevention of sheep ectoparasites with Asuntol and Neguvon dips.]**—Vet. med. Nachr. No. 4 pp. 179-209. 2244

Trials on sheep experimentally infested with blowfly larvae, ticks and keds confirmed the efficacy of dips containing "Asuntol" (Bayer 21/199) or "Neguvon" (Dipterex).

—R.M.

See also abst. 2160 (tsetse-fly tissue culture and development of trypanosomes to the infective stage).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

Ollerenshaw, C. B. (1959). **The ecology of the liver fluke (*Fasciola hepatica*).**—Vet. Rec. 71, 957-963. Discussion: pp. 963-965. [Author's summary modified.] 2245

There are six phases in the life cycle of *F. hepatica*: (1) transference from the host to the ground; (2) development within the egg; (3) transference from the egg to the snail; (4) development within the snail; (5) transference from the snail to the final host by herbage; (6) development within the final host. Each phase has its hazards, and in each there is loss in numbers.

Observations have shown that the most important factors are moisture and temperature. The interaction between these two factors and the parasite is analysed and discussed. It provides a basis for understanding the epidemiology of fascioliasis.

Barry, M. R. (1959). **Flukes in the respiratory tract of ducks.**—Aust. vet. J. 35, 432. 2246

Tracheophilus cymbius is reported for the first time in Australia, in Muscovy ducklings reared in close contact with wild water birds. The ducklings coughed and their growth was stunted. Numerous flukes were found in the trachea and lung. There appeared to be an improvement after two treatments with 5 g. hexachlorethane in the mash. Snails, *Lemnaea tenuistriata*, were numerous in the swamp where the ducklings fed. A related trematode, *Cyclocoelum jaenschi*, has been recorded from grebes in South Australia.

—H. McL. GORDON.

Gemmell, M. A. (1959). **Hydatid disease in Australia. IV. Observations on the incidence of *Echinococcus granulosus* on stations and**

farms in endemic regions of New South Wales. VI. Observations on the carnivora of New South Wales as definitive hosts of *Echinococcus granulosus* (Batsch, 1786), (Rudolphi, 1801), and their role in the spread of hydatidiasis in domestic animals.

VII. An appraisal of the present position and some problems of control.—Aust. vet. J. 35, 396-402, 450-455 & 505-514. 2247

The incidence of *E. granulosus* was surveyed in sheep and dogs on the same properties. Incidence in sheep appears to depend on climate, but it varied greatly between properties. It was unusual to find dogs over 6 years old heavily infested, even where a high proportion of sheep was infested. Young dogs often harboured more than 5,000 *E. granulosus*, but it was unusual to find more than 500 in dogs over 6 years old. It was thought that where dogs were fed on large quantities of infested offal a degree of immunity may develop early in life, with the result that at 4 years of age only light infestations are present. If the amount of infested offal is small the dogs may remain susceptible until later in life. On many properties working dogs are replaced at about 4 years old. If the incidence of infested offal is low and dogs are replaced at a young age there may be little development of immunity and the overall incidence of the parasite will remain high. The paper includes numerous figures on the incidence of the parasite.

The domestic dog and the dingo (*Canis dingo*) appear to be the only definitive hosts of *E. granulosus* in Australia and the geographical distribution of the dingo is limited. There are very few sheep in the dingo areas but there is a sylvatic cycle with wallabies and kangaroos as intermediate hosts and cattle as accidental intermediate hosts. A survey of the incidence in the red fox (an introduced animal) revealed only one case, which yielded only a single non-gravid segment. Experimentally *E. granulosus* did not develop to maturity in either the fox or the cat, and it was concluded that these animals are not definitive hosts for this species.

Earlier papers on the incidence and geographical distribution of *E. granulosus* in domestic and wild animals and man in Australia are reviewed [V.B. 27, 1815; 28, 1811].

Climate is favourable for the survival of the ova in Tasmania, parts of Victoria, New South Wales and the south-east of South Australia. Incidence and geographical distribution in domestic animals have remained constant for 30 years. Incidence in man may have

decreased in the same period but records are incomplete. At present hydatidosis in man is not a major problem in Australia. The economic loss from condemnation of infested viscera is considerable but too small to stimulate more energetic control measures. Neither preventive measures nor educational propaganda are carried out effectively in Australia.

The sylvatic cycle, involving the dingo and wallaby and kangaroo is established in parts of Queensland and N.S.W. There are very few hosts for the intermediate stage other than sheep, cattle, pigs and marsupials. The dog and dingo are the only significant final hosts. There have been some changes in incidence among domestic animals possibly associated with different methods of management (e.g. grazing by pigs) and feeding habits (e.g. increased incidence in dogs used to hunt rabbits; reduction of rabbits due to myxomatosis resulting in dogs being fed on sheep offal).

A map shows the distribution of sheep and cattle and the annual average rate of incidence in Australia.—H. McL. GORDON.

Levine, N. D. & Szanto, J. (1960). The effect of cadmium compounds on *Strongyloides papillosus* in sheep.—Amer. J. vet. Res. 21, 84-85. [Authors' summary modified.] 2248

S. papillosus eggs were eliminated from the faeces of lambs treated orally with capsules of cadmium iodide (75 to 100 mg. per kg. body wt.) and cadmium oxide (100 mg./kg.). Eggs were still absent 3-4 months later in 2 lambs treated with 100 mg./kg. of cadmium iodide, but a few were present one month later in a third lamb. Cadmium chloride (100 mg./kg.) eliminated the majority of *S. papillosus* eggs.

The iodide and oxide also appeared to have some slight effect against gastro-intestinal trichostrongylids in the treated lambs.

Diarrhoea and loss of weight were observed in some of the treated animals, but these were not serious.

Ritterson, A. L. (1959). Innate resistance of species of hamsters to *Trichinella spiralis* and its reversal by cortisone.—J. infect. Dis. 105, 253-266. 2249

Golden hamsters were not innately resistant to trichinella infection but Chinese hamsters were. The resistance of Chinese hamsters was clearly expressed in the tissue phase of the parasite and was apparently unrelated to early antibody response; it was believed to be the result of premature disintegration of

parasitized muscle fibres. Cortisone might diminish resistance by prolonging the structural integrity of injured cells.—R.M.

Seneviratna, P. (1960). **The use of bephenium chloride in the treatment of *Ancylostoma caninum* infections in dogs when other anthelmintics are contra-indicated.**—Vet. Rec. 72, 200-203. [Author's summary modified.] 2250

Bephenium chloride when given at the dosage rate of 20 to 50 mg. per kg. body wt. to 20 dogs with *Ancylostoma caninum* infection complicated with other diseases such as piroplasmosis (*Babesia gibsoni*), distemper, hepatitis or nephritis, appeared to be safe and effective.

Banks, A. W. & Michel, J. F. (1960). **A controlled trial of O,O-dimethyl 2,2,2-trichloro-1 hydroxy methyl phosphonate as an anthelmintic against *Ostertagia ostertagi* in calves.**—Vet. Rec. 72, 135-136. [Authors' summary modified.] 2251

A small trial in calves experimentally infected with *Ostertagia ostertagi* showed "Neguvon" to be highly efficient against mature but ineffective against immature worms. The effective dose rate lay between 66 and 110 mg. per kg. A warning is sounded concerning the occasional severe toxicity of the drug.

Roberts, F. H. S. & Keith, R. K. (1959). **Observations on the effect of treatment with phenothiazine on the development of resistance by calves to infestation with the stomach worm, *Haemonchus placei* (Place 1893) Ransom 1911.**—Aust. vet. J. 35, 409-414. 2252

Resistance to *H. placei* was readily acquired by calves given spaced and daily doses of infective larvae. When such calves were treated regularly with phenothiazine the development of resistance was delayed. Calves given daily doses of larvae and monthly doses of phenothiazine required three treatments before a persistent decrease in egg counts to low levels could be demonstrated, and continued to harbour heavy burdens of stunted worms which did not produce many eggs. The resistance of the late fourth and early fifth stage worms allows them to persist, and when the adult worms are removed by phenothiazine the immature ones resume development. The presence of adult worms has a retarding effect on the superimposed infestation [*V.B.* 28, 3633]. Although repeated

use of phenothiazine may delay development of resistance and leave the animals with a heavier worm population than would have become established in the absence of treatment, it is pointed out that phenothiazine can be used at intervals of ten days to control outbreaks.—H. McL. GORDON.

Bremner, K. C. & Keith, R. K. (1959). **The effect of copper deficiency on trichostrongylosis in dairy calves.**—Aust. vet. J. 35, 389-395. 2253

Trials were carried out in calves on properties where values for liver Cu were very low. One group was supplemented by i/v injections every six weeks of 30 mg. Cu, which maintained liver Cu values between 100 to 300 p.p.m. Cu dry weight. Liver Cu determinations were made on biopsy samples. The calves acquired heavy infestations with *Haemonchus placei*, *Bunostomum phlebotomum* and *Cooperia* spp. and very light infestations with *Trichostrongylus axei*, *Ostertagia ostertagi* and *Oesophagostomum radiatum*. In controls Cu declined to lowest levels of 14 p.p.m. at 7 to 8 months old. There were no significant differences in the degree of helminth infestation and it was concluded that Cu deficiency was not a major factor influencing susceptibility.—H. McL. GORDON.

Rose, J. H. (1960.) **Three gastro-intestinal nematodes recently recorded from British cattle.**—Res. vet. Sci. 1, 10-16. [Author's summary modified.] 2254

Ostertagia lyrata, *Trichostrongylus longispicularis* and *Cooperia mcmasteri*, recently recorded from British cattle, are briefly described, with illustrations to facilitate identification.

Banks, A. W. & Korthals, A. (1959). **Risk of worm disease in cattle moved from dry country to lush pastures.**—Aust. vet. J. 35, 460-462. 2255

Studies were carried out on young cattle which had been bred in arid country in Central Australia and transported a thousand miles south into South Australia. All had been infested early in life and had developed an immunity sufficient to protect them when introduced into high rainfall regions for fattening. *Trichostrongylus* spp., *Ostertagia* spp., *Haemonchus placei*, *Bosicola radiatum*, *Cooperia oncophora*, *C. pectinata*, *C. punctata*, *Bunostomum phlebotomum*, *Nematodirus* spp., *Trichuris* spp. and *Moniezia* spp. were present. *H. placei*, *C. pectinata*, and *C. punctata* were the commonest species.—H. McL. GORDON.

Riek, R. F. & Keith, R. K. (1959). **Studies on anthelmintics for cattle: V. Other organic phosphorus compounds.**—Aust. vet. J. 35, 403-408. 2256

Bayer 21/199 ("Asuntol") and ronnel (Dow ET-57) were very effective against *Haemonchus placei* at 0.25 and *Cooperia* spp. at 5 g./100 lb. body wt. They had variable activity against *O. radiatum* and none against *T. axei* or *B. phlebotomum*. Bayer 21/199 proved more toxic than ronnel and "Neguvon", but was safe at 0.25/100 lb. Symptoms of poisoning appear in 30 to 120 min. after administration of "Neguvon", but not until 48 to 72 hours after Bayer 21/199. Toxic effects of ronnel resembled those of 21/199. Little is known of the mode of action of these drugs and it is interesting to note that DDVP which is a dehydrochlorination product of "Neguvon" was ineffective. Other compounds that were ineffective as anthelmintics were chlorthion, diazinon and malathion.

—H. McL. GORDON.

Douglas, J. R. & Baker, N. F. (1959). **Ruelene, an organic phosphate, as an anthelmintic in sheep.**—J. Amer. vet. med. Ass. 135, 567-569. 2257

A more detailed account of work previously reported (*V.B.* 30, 490). "Ruelene", also known as Dowco 105, is 4-tert-butyl-2-chlorophenyl methyl methylphosphoramidate.

—R. M.

Ross, J. G. & Armour, J. (1960). **The significance of faecal egg counts and the use of serum albumen levels and packed cell volume percentages to assess pathogenicity of helminthiasis.**—Vet. Rec. 72, 137-139. [Authors' summary modified.] 2258

The authors discussed the significance of differentiated and undifferentiated strongyle faecal egg counts of cattle. Serum albumin level and packed cell volume percentage were shown to be useful measures of pathogenicity, when considered in conjunction with a series of differentiated faecal egg counts.

Michel, J. F. (1959). **Recent progress in the study of parasitic bronchitis.**—J. R. agric. Soc. 120, 28-44. 2259

A review of work on *Dictyocaulus* infestation in cattle.—R. M.

Baxter, J. T., Allan, D. & Patterson, J. T. (1959). **The influence of grazing "immune cows" on the level of *Dictyocaulus viviparus* infection on pasture.**—J. Brit. Grassl. Soc. 14, 293-297. 2260

Although intensive grazing by immune cattle reduced pasture infestation from 17 to one *D. viviparus* larva per lb. of herbage in 18 weeks, this low level of infestation persisted and was not eradicated by the cattle.—M.G.G.

Djafar, M. I., Swanson, L. E. & Becker, R. B. (1960). **Clinical and hematologic studies on pure *Dictyocaulus viviparus* (Bloch), lung-worm infections in calves.**—J. Amer. vet. med. Ass. 136, 200-204. [Authors' summary modified.] 2261

Clinical signs of lungworm disease in calves were: coughing; increased respiratory rate with expiratory dyspnoea; tactile fremitus; moist râles; nasal discharge; pyrexia; increased pulse rate; loss of weight; and diarrhoea.

No alterations were found in total erythrocytes, haematocrit values, haemoglobin, immature neutrophils, basophiles, monocytes, or alpha-globulin.

In calves that survived the infection significant increase in gamma-globulin began shortly after oral inoculation with infective larvae and reached a peak on the 35th day. There was also a significant eosinophilia.

In calves that died, there was a moderate increase in gamma-globulin that was delayed until after the 14th day. These animals had a low eosinophile response.

Kelley, G. W. & Olsen, L. S. (1960). **Critical tests of hygromycin B as an ascaricide of swine.**—Cornell Vet. 50, 60-65. [Authors' summary modified.] 2262

Hygromycin B fed at 6,000 units per lb. of ration for at least 3 weeks was 98% efficient as an ascaricide. When fed for 2 weeks the efficacy was 75% and for 8 days only 11%. The drug reduced the egg production of the female worms. Doubling the level of hygromycin accelerated its anthelmintic action.

Kelley, G. W. & Marsh, C. L. (1960). **Lack of larvicidal action of ronnel and Bayer 21/199 against migrating *Ascaris suum* in baby pigs.**—Amer. J. vet. Res. 21, 109-110. [Authors' summary modified.] 2263

Daily doses of ronnel at 50 mg. per kg. body wt. and Bayer 21/199 at 12.5 mg. per kg. had no effect on the migratory stage of ascaris larvae in pigs 2 weeks old.

Both drugs were toxic, as shown by the reduction of whole blood cholinesterase and the death of 2 pigs given Bayer 21/199.

Egerton, J. R. & Rothwell, T. L. W. (1959). **The occurrence of *Spirocerca lupi* in dogs in New Guinea.**—*Aust. vet. J.* 35, 425-426. 2264
Spirocerca lupi was found in the wall of the oesophagus in two dogs, and in an aortic

See also abstr. 2130 (black disease in sheep associated with *Cysticercus tenuicollis*).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Baxter, J. T. (1960). **Malignant melanoma in a sheep.**—*Brit. vet. J.* 116, 67-68. [Author's summary.] 2265

A case of malignant melanoma in a three year old Suffolk ewe is described. Many metastases were present in the liver.

Garlt, C. & Rössger, M. (1960). Ein statistischer und kasuistischer Beitrag zur Geschwulsterkrankung des Hundes. [Tumours in dogs. Statistics and case reports.]—*Mh. Vet-Med.* 15, 153-158. 2266

Tumours were found in 111 (6.2%) of 1,788 dogs in the animal clinic at Rostock. Most of the affected dogs were 7 years old. The chief site was the mammary gland, followed by the skin and subcutaneous tissue. There were 20 examples of sarcoma, 28 of carcinoma and 83 of benign tumours. P.M. findings are described in 24 dogs.—M.G.G.

Cotchin, E. (1959). **Some tumours of dogs and cats of comparative veterinary and human interest.**—*Vet. Rec.* 71, 1040-1050. Discussion: pp. 1050-1054. [Author's summary modified.] 2267

A survey was made of 4,187 tumours from dogs and 571 from cats examined from 1940-58 inclusive. The rarity of cancer of the lungs, stomach, large intestine or uterus in dogs and cats contrasts with their importance in human beings. Some tumours that are common in dogs and cats but rare in man would appear to provide material for detailed study, such as mast-cell tumours of the skin of dogs, mixed mammary tumours of the bitch, Sertoli-cell tumours of the testis of dogs and lymphosarcoma in cats.

Palmer, A. C. (1960). **Clinical and pathological features of some tumours of the central nervous system in dogs.**—*Res. vet. Sci.* 1, 36-46. [Author's summary.] 2268

A clinical and pathological description is given of 6 cases of primary neoplasia of the central nervous system in dogs. The tumours were: a transitional-type meningioma, 2 syncytial-type meningiomas (one with atypical

aneurysm in one of them. One dog had been imported from Australia three years before. In neither case was there any clinical evidence of the presence of the parasite.

—H. McL. GORDON.

histological features), a chromophobe adenoma, a glioblastoma multiforme and a spinal astrocytoma.

Litvinov, N. N. (1959). **Osteogenic sarcomata in dogs affected by Sr^{90} .**—*Problems of Oncology*, London 5, No. 6 pp. 40-47. [Author's conclusions modified.] 2269

Of 16 dogs exposed to Sr^{90} in doses causing chronic radiation disease, malignant tumours of bone of varying histological structure developed in 4, including multiple tumours in 2 dogs.

The tumours were noticed 610, 620, 880 and 935 days after the introduction of the radioactive substance.

I. Potel, K. (1959). Über das Vorkommen von Meningiomen bei Mensch und Tier. [Incidence of meningioma in man and animals.]—*Mh. VetMed. Suppl.* No. 1 pp. 43-46. 2270

II. Potel, K. & Urbaneck, D. (1959). Über zwei seltene primäre Hirntumoren beim Hunde. [Two rare primary brain tumours in dogs.]—*Ibid.* pp. 72-77. 2271

I. About 6% of intracranial tumours in domestic animals are meningiosarcomata, which is far below the incidence in man. It is likely that many references in the older veterinary literature to sarcoma, fibrosarcoma, melanosarcoma etc., were probably in fact to meningioma, which, particularly in cattle, closely resembles connective tissue tumours. Incidence is higher in older animals, particularly in females.

II. A description of a primary cerebellar haemangioblastoma in a 10-year-old bitch and of a diffuse meningeal sarcoma in another, 7 years old. Neoplasms of this kind are very rare in domestic animals, but more frequent in man.—E.G.

Perek, M. (1960). **An epizootic of histiocytic sarcomas in chickens induced by a cell-free agent.**—*Avian Diseases* 4, 85-94. [Author's summary modified.] 2272

An outbreak of histiocytic sarcoma in a flock of hens is described. The neoplasm was

found chiefly in the liver, spleen and kidneys and in some cases in the intestines and skin.

Histologically, a variety of cells composed the neoplasm. A mixture of spindle-shaped cells with stellate reticulum cells embedded in an argentophilic reticulum were found together with transitional forms. Foreign body giant cells accompanied massive necrotic regions and the aggregations of macrophages.

Transplantability of the neoplasm was established by i/v, i/m and i/p injections with cell suspensions. Cell-free filtrates, as well as 50,000 r irradiated tissue material induced characteristic neoplastic growth in injected birds.

Bacteriological and parasitological investigations proved negative.

Bendixen, H. J. (1959). Undersøgelser over kvaegets leukose. 3. Om kontrollen med leukosebesættninger ved haematologiske undersøgelsesmetoder. [Studies of leucosis in cattle. III. Control by haematological examination.]—Nord. VetMed. 11, 733-758. [In Danish. Summaries in English and German. For previous parts see V.B. 28, 501 & 3302.] 2273

Cattle were judged leukaemic if their blood contained more than 12,000 lymphocytes per cu. mm. at 0-1 years of age. Comparable figures for other ages were 11,000 at 1-2 years, 9,500 at 2-3 years, 8,500 at 3-4 years, 7,000 at over 4 years. Results of examination of 59 herds were given. Recommendations for control of the disease were made.—R.M.

Cohen, D., Booth, S. & Sussman, O. (1959). An epidemiological study of canine lymphoma and its public health significance.—Amer. J. vet. Res. 20, 1026-1031. 2274

This report describes the veterinary side of a joint study in which an epidemiological survey is being made of the incidence of

malignant lymphoma [lymphatic leucosis] in man and dogs in 40 communities drawn from 8 socio-economic areas of New Jersey. In 1957, 385,427 dogs of 6 months of age and over were registered as to age, breed and sex in connexion with the Rabies Control Programme. An analysis of a sample of 55,602 selected case records gives base-line data for the age, breed and sex distribution of dogs in the State. Further census surveys are planned for 1960 and 1962.

A case report system has been developed to determine the incidence of lymphatic leucosis in dogs in these communities. It is hoped that the project will in the next few years yield adequate numbers of cases for the assessment of age-, breed- and sex-specific death and incidence rates. Areas of high incidence may thus be detected and studied further.—E. COTCHIN.

Thomas, C. R. & Jones, R. S. (1959). Bacterial polysaccharide, cortisol, and acute leukemia in the rat.—Proc. Soc. exp. Biol., N.Y. 102, 537-539. [Authors' summary modified.] 2275

Klebsiella pneumoniae polysaccharide injected i/v cured rats with leukaemia due to Murphy-Sturm lymphosarcoma cells. Cortisol administration markedly inhibited the anti-leukaemic effect of the bacterial polysaccharide. Resistance to tumour cells followed the polysaccharide-induced recovery from leukaemia.

Darcel, C. le Q. (1960). The experimental transmission of avian leukosis: a review.—Cancer Res. 20, 2-17. 2276

D. discussed the types of virus, natural transmission, experimental transmission, titration of virus activity, influence of immunity on transmission, location of the virus, features of the disease, and unsolved problems [203 references].—R.M.

NUTRITIONAL AND METABOLIC DISORDERS

I. McCance, R. A. (1960). Severe undernutrition in growing and adult animals. I. Production and general effects.—Brit. J. Nutr. 14, 59-73. 2277

II. Pratt, C. W. M. & McCance, R. A. (1960). Severe undernutrition in growing and adult animals. II. Changes in the long bones of growing cockerels held at fixed weights by undernutrition.—Ibid. 75-84. [Authors' summaries modified.] 2278

I. By reduction of food young pigs were

held at weights of 4-14 kg. for 1-2 years. Cockerels were held between 100 and 200 kg. for 6 months. The skin of the pigs became highly abnormal but there was no vitamin A deficiency. The cockerels did not develop adult plumage, but the skin remained normal.

Normal growth and differentiation of the head and body was prevented and led to changes of many kinds. The teeth for example, continued to develop and impacted in the undeveloped jaw. The nails and beak continued to grow. The adrenals became unduly

During rehabilitation on unlimited rations : large for the weight of the body, the spleen unduly small. The pigs were not anaemic.

(a) food conversion was about normal and the increase of weight very rapid, (b) the abnormal appearances gradually disappeared, but (c) the vulva of the female pigs became very swollen long before the animals attained sexual maturity and remained so. An examination of the internal organs at this stage revealed nothing abnormal that could account for the swelling except small cystic follicles in one ovary. The swelling was partly fat, but mainly hyperplasia of the vulval apocrine glands.

II. The femur, humerus and tibia were studied in cockerels that had been severely undernourished for periods of up to 182 days, and compared with bones from well-nourished growing birds.

The bones increased in size (for upwards of 50 days) although there was little increase in body-weight. There was radiological evidence of disturbed endochondral ossification. Undifferentiated cells in the subperiosteal zone ceased to divide and to differentiate, and osteoblasts disappeared.

Periosteal bone formed before the period of undernutrition was gradually removed and the bone formed during the experiment was more finely fibred than normal bone and contained cement lines. Epiphyseal cartilage showed little change other than cessation of mitosis. Mitotic figures gradually disappeared from the proliferative zone of the growth cartilage, but maturation continued at a very reduced rate resulting in partial exhaustion of the proliferative zone. In later stages there was a periodic failure of maturation and transverse bands of uncalcified matrix appeared in the hypertrophic zone.

Medullary osteoblasts became scarce and endochondral bone ceased to form. This change resulted in a metaphysis composed largely of trabeculae of calcified cartilage, and as a consequence remodelling was disturbed. Osteoclasts were numerous in all situations throughout the period of undernutrition, and considerable activity was apparent in the early weeks. Invasion of the humerus by the cervical air sac took place before the normal age.

Kendall, K. A. & Hays, R. L. (1960). **Maintained pregnancy in the rat as associated with progesterone administration and multiple-nutrient deficiency.**—*J. Nutr.* 70, 10-12. [Authors' summary modified.] 2279

The feeding of a diet containing 0.38%

of minerals but otherwise adequate from the day of mating, until autopsy 20 days later, resulted in normal litter size with an average foetus weight 76% of normal.

When a diet containing 94% of sucrose and 8% of hydrogenated vegetable fat was similarly fed the number of living young at autopsy was 47% of normal, with foetus weights averaging 60% of normal.

Daily injection of 5 mg of progesterone was accompanied by increased litter size when females were fed for 20 days following mating a diet consisting solely of sucrose and distilled water. Under these conditions the average foetus weight was reduced to 56% of normal.

The results suggest that progesterone is related either directly or indirectly to the mobilization of nutrients from maternal stores or to the maintenance of placental function, thus permitting the life of the foetus to be maintained for a period of 20 days.

Adams, R. S., Sautter, J. H., Gullickson, T. W. & Gander, J. E. (1959). **Some effects of feeding various filled milks to dairy calves. IV. Necropsy findings, electrocardiographic studies, and creatinuria ratios.**—*J. Dairy Sci.* 42, 1580-1591. 2280

Calves were fed skim milk to which was added maize oil, lard, or butter oil prepared from oxidized butter. Controls were given fortified skim milk or whole milk. All were killed at 90 days and examined P.M. 12 of 16 calves given maize oil, 3 of 6 given the lard and 2 of 3 given the butter oil, showed typical lesions of muscular dystrophy in skeletal muscle and some also had cardiac lesions. The lesions are described (5 plates). None of the calves showed creatinuria, but some in the maize oil group had abnormal electrocardiograms. Calves in which the maize oil or lard diet was supplemented with tocopherol and those in which the maize oil was hydrogenated showed no signs of dystrophy.—E. J. CASTLE.

Sullivan, J. T. & Hershberger, T. V. (1959). **Effect of chlorine dioxide on lignin content and cellulose digestibility of forages.**—*Science* 130, 1252. 2281

Chlorine dioxide gas was passed through a glass tube containing 5 to 10 g. of finely ground dried roughage for 4 to 24 hours. Treatment of grass and straw by this method decreased the acid-insoluble lignin content, as determined by chemical analysis, and significantly increased the digestibility of the cellulose as determined by the artificial rumen

technique. Larger amounts of sodium chlorite, used in the production of the ClO_2 , resulted in greater changes.—E. J. CASTLE.

Cotsell, J. C. & Edgar, G. (1959). **The utilisation of sown pastures in Merino breeding on the granite soils of eastern New England, New South Wales. Further investigations into Merino breeding on the granite soils of eastern New England.**—Aust. vet. J. 35, 515-523. 2282

This deals with an extension of work previously reported [*V.B.* 27, 3777] on the use of sown pastures on the New England tablelands in N.S.W., where the problem is to provide winter nutrition. In a six-year trial two comparable groups of sheep were grazed: (1) 7 days a week on sown pastures and (2) $3\frac{1}{2}$ days on sown pasture and $3\frac{1}{2}$ days on natural pasture. Body weights, wool production, stocking rates, lambing percentages and monetary returns were recorded. The authors state that neither of the two systems of grazing represents optimal use of the land but, rather, different stages in the development of a property. The sheep grazed 7 days a week on sown pasture showed a net return of £11 3s. per acre as against £3 16s. per acre for the $3\frac{1}{2}$ days group.—W. L. HINDMARSH.

Walker, D. (1960). **Bloat in cattle. Field observations and post-mortem findings in beef and dairy cattle.**—Aust. vet. J. 36, 17-20. [Author's summary modified.] 2283

An acute outbreak of bloat in a dairy herd and P.M. findings are described. The pathological findings in sporadically occurring deaths due to bloat in beef herds are outlined. No significant difference was noted between these and the findings in the dairy cattle. It is concluded that diagnosis may be made on P.M. findings.

Shinozaki, K. (1959). **Studies on experimental bloat in ruminants. 5. Effects of various volatile fatty acids introduced into the rumen on the rumen motility.**—Tohoku J. agric. Res. 9, 237-250. 2284

Acetic, propionic or butyric acid was introduced through rumen cannulae into three goats, and rumen motility studied by a mercury manometer and kymograph connected to the cannula. Acetic acid had no great inhibitory effect on rumen movements, but butyric, and to a slightly lesser degree, propionic acid, inhibited motility markedly at the higher strength. 0.5 M weight butyric and 0.6 M propionic caused complete inhibition for about

one hour. With the inhibition there was a concurrent loss of appetite and signs of discomfort. The pH of the rumen never fell below 4, and it was noted that a slow return to the normal pH was associated with prolonged rumen inhibition. When acetic or butyric acids were introduced into the rumen there was a marked increase in the total ketone level of the blood.—E. J. CASTLE.

Phillipson, A. T. & Mangan, J. L. (1959). **Bloat in cattle. XVI. Bovine saliva: the chemical composition of the parotid, submaxillary, and residual secretions.**—N.Z. J. agric. Res. 2, 990-1001. [Authors' summary modified.] 2285

The saliva from the parotid and submaxillary glands and the residual saliva that flowed from the mouth, were collected from calves aged 5-8 months and analysed for electrolytes and nitrogenous compounds. Carbachol and inflation of the rumen were used to induce salivation.

Parotid and residual saliva contained Na^+ and HCO_3^- —at concentration of about 100 milli-equivalents litre, potassium and phosphate of approx. 15-20, while calcium was in the range 3-7. The nitrogen of parotid saliva was mainly in the form of urea. Residual saliva contained in addition appreciable concentrations of mucoprotein. The compositions of both secretions were independent of the type of stimulation used.

The mucoprotein content of submaxillary saliva was greater than that of either parotid or residual saliva, but the urea concentration did not differ significantly.

Submaxillary saliva induced by carbachol stimulation contained less Na^+ and HCO_3^- —and more Ca^{2+} —than the parotid and residual saliva. The content of potassium was approx. the same but $\text{H}(\text{PO}_4)^{2-}$ —was present only in traces.

Inflation of the rumen produced approximately a fivefold increase in mucoprotein concentration of submaxillary saliva without significantly altering the concentration of other components.

The relationship between saliva and bloat is discussed.

Fletcher, D. W. & Hafez, E. S. E. (1960). **Microbiology of the bloated dwarf rumen. The fermentation activity.**—Appl. Microbiol. 8, 22-27. [Authors' summary modified.] 2286

Measurements of changes in body circumference in homozygous dwarf Hereford cattle show that a diurnal bloat cycle is present.

Increase in body circumference is associated with maximum microbial fermentation rate. Holotrichous protozoa were either absent or in greatly reduced numbers, and showed sluggish motility. In non-bloating dwarfs, dwarf-like animals, and in the normal controls, the protozoa were active and abundant. The fermentation rate of bloating dwarfs was significantly greater than that of the others. The rate of volatile acid production was significantly greater in dwarfs that bloated, but there was no significant difference in metabolic carbon dioxide or methane production.

Preston, T. R., Aitken, J. N., MacLeod, N. A., McDiarmid, A. & Rosen, G. D. (1960). **An initial investigation on the effects of low level feeding of hydroxyzine dihydrochloride on growth, endocrines and carcass measurements of fattening cattle.**—*Anim. Prod.* 2, 27-32. [Authors' summary modified.] 2287

Cattle receiving 5 mg. hydroxyzine dihydrochloride daily gained 12.7% faster and manifested 12% better feed conversion ratio than the control, but these effects were not statistically significant. Carcass quality and endocrine glands were not affected.

Hughes, J. P. & Cornelius, C. E. (1960). **An outbreak of grass tetany in lactating beef cattle.**—*Cornell Vet.* 50, 26-33. [Authors' summary modified.] 2288

A high incidence of grass tetany occurred in a herd in California grazing lush growth of pasture grasses produced by rain after drought. Cows had paresis, muscular tremors, hypomagnesaemia, hypocalcaemia, and hypokalaemia. Clinically normal lactating cows, bulls and steers on the same pastures also had varying degrees of hypomagnesaemia.

Blaxter, K. L., Cowlshaw, B. & Rook, J. A. F. (1960). **Potassium and hypomagnesaemic tetany in calves.**—*Anim. Prod.* 2, 1-10. [Authors' summary.] 2289

Four groups of four calves were given amounts of magnesium, both with or without an excess of potassium, added as potassium chloride.

The excess of potassium resulted in the death of three of the eight calves, the clinical signs observed before death being cardiac insufficiency, oedema, severe muscular weakness and muscular atony. The excitability of motor nerves, measured by the method of Kugelberg (1944), was reduced by excess dietary potassium and the serum concentration of potassium was increased. The potassium content

of the erythrocytes declined with age, irrespective of dietary treatment.

Although this evidence of potassium intoxication was obtained, no concomitant abnormalities were induced in magnesium metabolism by the excess of potassium whether or not the calves received rations containing adequate amounts of magnesium.

Excess potassium had no effect on the concentration of potassium or magnesium in the muscle or on the Ca:Mg ratio in bone.

Magnesium deficiency resulting in tetany was shown to have no statistically significant effect on the intracellular concentration of magnesium in the muscle. A very small drop in erythrocyte magnesium was noted. No effect on the excitability of motor nerves was observed.

The results suggest that the effect of excessive manuring of pastures with potassic fertiliser in increasing the incidence of hypomagnesaemic tetany is not due to a direct effect of potassium on the magnesium metabolism of the animal.

O'Dell, B. L., Morris, E. R. & Regan, W. O. (1960). **Magnesium requirement of guinea pigs and rats. Effect of calcium and phosphorus and symptoms of magnesium deficiency.**—*J. Nutr.* 70, 103-111. [Authors' summary modified.] 2290

Excessive intake of phosphorus accentuated the symptoms of Mg deficiency. The injurious effect of phosphorus, when added to a diet low in Mg, was more marked than that of calcium but the effect was largely eliminated by adequate Mg. When the diet contained 0.9% Ca and 0.4% P the magnesium requirement was determined to be 80 mg. per 100 g. of diet. When phosphorus was increased to 1.7%, the requirement rose to 240 mg.

The symptoms of Mg deficiency in the g.pig include slow growth, soft-tissue, calcification, stiffness in the hind limbs, exostosis of the mandibles, overgrowth of the molars, and erosion, softening and decay of the incisors.

Wilson, A. A. (1960). **Magnesium homeostasis and hypomagnesaemia in ruminants.**—*Vet. Rev. Annot.* 6, 39-52. 2291

W. discussed recent literature with special reference to the general problem of magnesium homeostasis and concluded that although factors influencing absorption of Mg from the gastro-intestinal tract are of great importance,

the role of renal, endocrine and stress factors in Mg homeostasis must not be overlooked.

—R.M.

Armstrong, M. C. (1959). **Unthriftiness of lambs in South Canterbury.**—N.Z. J. Agric. 99, 335 & 337-338. 2292

70 outbreaks of unthriftiness in lambs in New Zealand were investigated during the past two summers. Affected lambs were examined clinically and post-mortem. Numerous cobalt supplement trials were carried out with or without iron and copper. Seven selenium trials were also conducted.

Liver copper content was normal on all farms except two. The addition of iron to the cobalt supplement gave no extra benefit. There was evidence that there was a seasonal deficiency of cobalt on light soils, especially during a warm wet season where there was rapid growth of lush grass. The results of the selenium trials showed improved weight gains averaging 2-5 lb. per head over 60-70 days. With the exception of two lambs there were no signs of nitrate-nitrite poisoning. High worm counts were found in all severe cases of unthriftiness and *Nematodirus*, *Ostertagia* and *Trichostrongylus* species were identified in individual cases. Advice on control of internal parasites is given.—E. J. CASTLE.

Williamson, G. T. & Butler, G. W. (1959). **Report on a hogget ill-thrift trial.**—N.Z. vet. J. 7, 148-150. 2293

Treatment of the ill-thrift syndrome described by Clarke & Filmer [*V.B.* 28, 3648] by single i/m inj. of liver extract resulted in lower mortality and better weight gains than in untreated controls. The content of vitamin B₁₂ in the extract was too low to be responsible for its curative effect. Administration of cobalt "bullets" made affected sheep worse. Neither copper sulphate (mixed with nicotine and arsenic), nor iron dextran injection influenced the syndrome.—R.M.

Vermeulen, C. W. (1959). **Effects of high calcium intakes on urine in animals.**—Fed. Proc. 18, 1096-1100. [Author's summary modified.] 2294

When rats were fed extra calcium, the urine calcium rose to very high levels. Paradoxically, the formation of calcium phosphate stones was inhibited. Associated urine changes consisted of a profound drop in urine phosphorus and a sharp rise in urine citrate. The rise in citrate was shown to be due to coincident alkalization, not to the calcium itself.

Other experiments were mentioned in which phosphate additions to the diet produced the reverse urine changes (rise in phosphorus, fall in calcium). The experiments illustrate the reciprocal relations existing between these 2 ions, presumably acting by alterations in gut absorption. This intimate interrelationship has hitherto received little attention in stone theory. They point to the error inherent in a common attitude towards stone disease in which urolithiasis is more or less equated with calcium, as if calcium were the only item of significance in the production of stones.

Harrison, H. E. (1959). **Factors influencing calcium absorption.**—Fed. Proc. 18, 1085-1092. 2295

The chief factors influencing the absorption of Ca are the concentration of Ca ion in the intestine, vitamin D, and the capacity of the skeleton to take up bone salt. The body can adjust itself to the Ca intake by decreasing or increasing the absorption. The adjustment may not, however, be complete, and excessive absorption may occur if the intake of vitamin D is high.—M.G.G.

Murphy, W. J. B., McBarron, E. J. & Doyle, P. W. (1959). **Bent leg in goats.**—Aust. vet. J. 35, 524-529. 2296

Bent leg in young buck goats in a pedigree herd is described. The forelegs may be curved inward (knock kneed) or outward (bow legged). The condition is first seen about the age of four months. The goats are well conditioned and grow normally apart from the deformity. Some recover but some remain deformed. Experiments suggest that the condition is associated with Ca/P ratio of the diet.—W. L. HINDMARSH.

Pullar, E. M. (1960). **Mineral deficiencies in pigs. II. Bone ash estimations as a diagnostic aid in rickets and osteomalacia.**—Aust. vet. J. 36, 31-45. [Author's summary modified.] 2297

An improved technique for routine bone ash estimations is described. Sampling error was eliminated by using complete bones. The time factor and error due to multiple manipulations was eliminated by estimating the ash content on a green bone basis. The bones used were the metacarpi and metatarsi as they are (a) a suitable size, (b) provide identical duplicate samples, and (c) are readily available without mutilating the carcass. The test is accurate and repeatable. The bone ash content increases with the age of the subject. Bone

length is a reasonable index of the age of the subject. The bone ash content is relatively low in cases of rickets and osteomalacia. An age correlation factor and arbitrary standards for normal and low bone ash contents are defined. The use of these standards as a diagnostic aid is discussed.

Shcherbakov, E. V. (1960). [Abortion in cows associated with low amounts of vitamin A in blood of the dam and in liver of the foetus.] —*Veterinariya*, Moscow 37, No. 1 pp. 44-45. [In Russian.] 2298

In 46 cases abortion could not be attributed to bacterial infection. The carotene content of the serum of the cows ranged from 0.025 to 0.45 mg.% and that of foetal liver averaged 0.05 mg.%.—R.M.

Jäger, O. (1959). Über den Einfluss parenteral verabreichter Vitamin A-Gaben auf den Desoxyribonukleinsäure- und Ribonukleinsäuregehalt in verschiedenen Organen der Albinoratte. [Content of nucleic acids in organs of rats after parenteral administration of vitamin A.]—Inaug. Diss. Munich pp. 29. 2299

Extending previous work done at Munich on this subject [*V.B.* 28, 2964 & 3685], J. found that i/m injection of 1,000 or 50,000 units vitamin A palmitate in oil, or vitamin A alcohol in water (with 1% Tween 60) increased the content of nucleic acids in various organs.—R.M.

Bieri, J. G., Briggs, G. M., Pollard, C. J. & Fox, M. R. S. (1960). Normal growth and development of female chickens without dietary vitamin E or other antioxidants.—*J. Nutr.* 70, 47-52. [Authors' summary modified.] 2300

Chicks were fed from hatching, purified, vitamin E-free diets containing no added antioxidants for 6 to 12 months. Alpha-tocopherol disappeared from the tissues of the chicks after 5 weeks. When compared with control chicks receiving vitamin E, the depleted chicks appeared normal, grew at the same rate and laid eggs at the same time. The possible tocopherol content of the diet, and the implications of these results on the nutritional and biochemical functions of vitamin E, are discussed.

Andersson, P. (1960). Nutritional muscular dystrophy in cattle: with special reference to the functional state of the thyroid.—*Acta path. microbiol. scand. Suppl.* No. 134 pp. 91. [In English.] [Thesis, Helsinki.] 2301

Muscular dystrophy of cattle occurs in western Finland in an area of black clay rich in sulphides. Most cases occur in spring in calves of both sexes. The tocopherol content of the blood of affected calves was lower than in healthy calves in the same area, but the selenium content was adequate. Hay from affected farms had a low tocopherol content (31 mg./kg.) but it was not much lower than in hay from farms free from the disease (36.6 mg./kg.). Hypofunction of the thyroid gland with a low proportion of epithelium to colloid was found in affected calves and to a lesser degree in healthy calves from the same area. Eighteen calves fed a ration poor in vitamin E for 23 weeks or without cod-liver oil or potassium iodide did not develop muscular dystrophy, but histological examination of the thyroid glands revealed hypofunction. It was concluded that the condition is a vitamin E deficiency, and might be caused by a sulphur compound in the herbage.—M.G.G.

Bateman, J. K. (1960). "Warfarin poisoning at Derby Stadium"—a different interpretation.—*Vet. Rec.* 72, 192-193. 2302

Reference is made to an article in *Vet. Rec.* 72, 102, in which greyhound mortality in Derby was ascribed to warfarin poisoning (from contaminated biscuit) or canine virus hepatitis. Personal investigation revealed that if food contamination had actually occurred the maximum daily dose of warfarin per dog would have been a fraction of 0.05 mg./kg. daily—the single fatal dose is 20 mg./kg., though 5-10 mg./kg. may be fatal if administered over 3 days. Canine virus hepatitis was ruled out in spite of positive blood tests. The opinion is expressed that the cause was vitamin deficiency as a result of faulty diet which consisted of overcooked meat and vegetables mixed with biscuit. After the diet was improved no further mortality occurred.

—T.E.G.R.

I. Štukovský, R., Németh, Š. & Virsik, K. (1960). O niektorých faktoroch ovplyvňujúcich váhu hovädzej štitnej žľazy. [Factors influencing thyroid weight in cattle.]—*Sborn. čes. Akad. zemědělsk. Věd. vet. Med.* 5, 129-142. [In Slovak. Summaries in German and Russian.] 2303

II. Štukovský, R., Németh, Š., Virsik, K. & Prodbaba, J. (1960). Súbežnosť výskytu strumy u ľudí a hovädzieho dobytku na západnom Slovensku. [Incidence of goitre in man and cattle in Western Slovakia.]—*Ibid.*

[In Slovak. Summaries in English, German and Russian.] 2304

I. The authors studied thyroid weight in relation to body weight and environment in 2,361 slaughter cattle from areas free from goitre, areas where goitre was endemic and areas where it occurred sporadically. Values were higher in cattle from goitre-areas and higher in cows than in bulls, steers or heifers.

II. Further findings in 1,794 cattle confirmed a relationship between thyroid weight in cattle and endemic goitre in man in certain areas in Western Slovakia, associated with iodine deficiency and certain goitrogenic factors. The prophylactic use of iodized salt licks for cattle was discussed.—E.G.

Bachelard, H. S. & Trikojus, V. M. (1960). **Plant thioglycosides and the problem of endemic goitre in Australia.**—*Nature*, Lond-185, 80-82. 2305

It has been reported previously that

turnip weed (*Rapistrum rugosum*) and other crucifers are a source of goitrogens in cow's milk [*V.B.* 30, 213]. Cheirolone was the principal component of the thioglycosides in turnip weed, and it was goitrogenic in rats. The problem arises of how the isothiocyanate in cheirolone is transformed in the rumen into goitrogenic disubstituted thiourea because isothiocyanates by themselves are not, or only weakly, goitrogenic.—R.M.

Simesen, M. G. & Møller, T. (1959). **Liver biopsy on cattle. II. The patho-morphological picture of ketosis.**—*Nord. VetMed.* 11, 787-790. [In English. Summaries in German and Danish.] 2306

Biopsy was done 1-4 times on 5 normal cows before or after calving and 20 cows with ketosis. The main findings in ketosis were fatty infiltration and a low glycogen content of liver tissue. A colour plate shows the histology of 6 stained sections.—R.M.

DISEASES, GENERAL

Anon. (1959). **FAO/OIE Animal Health Year Book for 1958.**—pp. 201+vi. Rome: Food and Agriculture Organization. Paris: Office International des Epizooties. [In English, French and Spanish.] 2307

This trilingual yearbook is made up of tables which show the incidence of about 140 diseases in 116 countries. Compared with last year's edition [*V.B.* 29, 1523] it is a great improvement in appearance and in ease of using. A key to numerical codes which folds out from the back cover is very useful. This time there is also an index to names of diseases. In addition to the tables there are notes on the present position of some of the major diseases and three articles: eradication of bovine TB. by J. N. Ritchie; The Pan American Zoonosis Center by B. D. Blood; and the Pan American Foot-and-Mouth Disease Center by W. M. Henderson.—R.M.

Truijen, W. T. (1959). **Eerste indrukken bij de georganiseerde bestrijding van varkensziekten in Noord-Brabant. [First results of a scheme for improving the health of pigs in North Brabant.]**—*Tijdschr. Diergeneesk.* 84, 1367-1379. [In Dutch. Summaries in English, French and German.] 2308

There were 520,000 pigs in the province in 1958. A quarter of the piglets died before reaching a weight of 25 kg. Of those that survived, 8% died before reaching slaughter weight. The annual loss was put at 5.5 million

florins. It was decided to set up a voluntary health service for pigs similar to those operating in Germany. 218 of 223 breeding herds joined the scheme and each contributed 25 florins a year to its cost.

The first half-yearly examination revealed bad housing on 4.5% of farms and bad feeding on 9.2%; virus pneumonia was present on 20%, mange on 77%. Examination of faeces samples revealed more than 200 helminth eggs per g. in 78% of the 218 herds.—R.M.

Klein, D. R. & Olson, S. T. (1960). **Natural mortality patterns of deer in southeast Alaska.**—*J. Wildlife Mgmt* 24, 80-88. 2309

Deer winter mortality data collected during 1952-1956 in Southeast Alaska contained distinct patterns of sex and age distribution and regional variations in magnitude. Starvation accounted for at least 80% of the annual winter loss. Other causes of death were accidents and predation.—R.M.

Bowden, R. S. T. (1959). **Diseases of chinchillas.**—*Vet. Rec.* 71, 1033-1035. Discussion: pp. 1035-1039. 2310

B. discussed the literature and his own findings in 47 chinchillas, which included infections with *Proteus*, *Pseudomonas aeruginosa*, *Erysipelothrix monocytogenes* and *Giardia*. R. N. T. W. Fiennes and O. Graham-Jones discussed feeding, handling, a shock syndrome and faulty teeth.—R.M.

Krook, L., Larssen, S. & Rooney, J. R. (1960). **The interrelationship of diabetes mellitus, obesity, and pyometra in the dog.**—*Amer. J. vet. Res.* 21, 120-124. [Authors' summary modified.] 2311

In a review of necropsies on 10,993 dogs, 971 were obese, 487 had pyometra, and 167 had diabetes mellitus. Obesity tended to occur at a slightly earlier age than diabetes mellitus and pyometra. More females than males were affected by obesity and diabetes mellitus. Analysis of breed distribution revealed that certain breeds were predisposed or resistant to diabetes mellitus, obesity, and pyometra. Predisposition or resistance to any of the three diseases was usually associated with predisposition or resistance to all three diseases. The aetiological implications of this diabetes mellitus-obesity-pyometra syndrome are discussed.

Corrado, A. & Galliano, M. (1959). **Strapazzo e mioglobinuria paralitica. Osservazioni e note. [Fatigue and equine myohaemoglobinemia.]**—*Progr. vet., Torino* 14, 916-919. 2312

An account is given of myohaemoglobinemia in 3 mules after prolonged muscular fatigue. Treatment consisted in phlebotomy, i/v administration of calcium gluconate, inj. of cardiac and respiratory tonics and vitamin B₁. In 2, in which paraplegia persisted in a severe form, corticotrophin was given followed by adrenaline. All 3 recovered.—T.E.G.R.

I. Cheli, R. (1959). **Sulla paresi spastica dei bovini. [Spastic paresis in cattle.]**—*Nuova Vet.* 35, 152-159. [Summaries in English, German and Spanish.] 2313

II. Cheli, R. (1959). **Sulla "sindrome spastica" del bovino (nota preventiva). [A spastic syndrome in cows.]**—*Ibid.* 291-295. [Summaries in English, German and Spanish.] 2314

I. Spastic paresis was seen in three bulls (2 brown Swiss and one Friesian) and in a Friesian heifer.

II. A spastic condition in 12 cows was described. In most cases only the hind limbs were effected and all the cows were 7 years old; in some the symptoms had appeared soon after calving. Aetiology, prognosis and treatment will be dealt with in another article.

—T.E.G.R.

Bentinck-Smith, J., Roberts, S. J. & Katz, E. M. (1960). **A bleeding disease of newborn**

calves.—*Cornell Vet.* 50, 15-25. [Authors' summary modified.] 2315

Two male and two female Holstein calves born to the same dam but by two unrelated sires, showed a severe bleeding tendency. Three died within 24 hours, but one female survived after transfusion. The bleeding was attributed to a multiple coagulation defect, low levels of prothrombin, fibrinogen, and factor V. There was delayed thromboplastogenesis, possibly due to factor IX deficiency.

Wensvoort, P. (1959). **Langdurige droogte en dierziekten op Texel. [Locomotorory disturbance in heifers and sheep associated with prolonged drought.]**—*Tijdschr. Diergeneesk.* 84, 1420-1421. [In Dutch. Summary in English.] 2316

Heifers standing still had limbs placed more widely apart than normal and sometimes nodded their head. Sometimes they started trembling and fell over. When chased they ran with arched back and with delayed action of the hind limbs, resulting in stumbling and falling. In lambs and sheep there were similar signs; inability to move forward was more pronounced. The condition did not affect appetite or grazing and a good supply of drinking water was available in every case. When the rain came the animals gradually recovered.—R.M.

Pryor, W. J. (1960). **An outbreak of "separated wall" in sheep in Victoria.**—*Aust. vet. J.* 36, 23-24. [Author's summary modified.] 2317

Acute lameness in sheep affecting 20% of a mob is described. The syndrome was associated with thick pastures and wet conditions and appeared identical to that occurring in West Australia and formerly known as "clover burn". Treatment consisting of paring out affected cavities and removal of sheep to drier conditions appeared completely effective.

Zlotnik, I. (1960). **A case of focal symmetrical encephalopathy in a sheep.**—*Vet. Rec.* 72, 158 & 159. [Author's summary modified.] 2318

In an adult sheep symmetrically distributed partial degeneration of myelin was present in the mesencephalon and cortex.

Gwatkin, R. & Annau, E. (1959). **Rhinitis of swine. XIII. A possible relationship between the electrophoretic pattern of light and heavy birth weight pigs and their susceptibility to**

infection.—Canad. J. comp. Med. 23, 387-390. [Summary in French.] 2319

Preliminary studies revealed a striking difference in electrophoretic pattern between piglets of light and heavy birth weights. The light piglets (usually those below 1,000 g. at birth) had a pronounced alpha and a lower beta-globulin peak, while in piglets double that weight at birth the pattern was reversed, the beta-globulin peak being the more pronounced. These findings might explain the greater susceptibility to spontaneous infection with atrophic rhinitis of piglets of light birth weight, since the antibacterial and virus-neutralizing globulin, properdin, is found in the beta-globulin fraction of serum.—F.E.W.

Cotchin, E. (1960). **Calcium gout (Kalkgicht) and calcosinosis circumscripta in dogs.**—Brit. vet. J. 116, 3-8. [Authors' summary.] 2320

Granulomatous lesions have been examined from 32 dogs, consisting of chalky-white masses of calcium salts embedded in fibrous tissue. The lesions occurred particularly in "heavy" dogs (19 were in Alsations), and chiefly in young dogs (23 in dogs 2 years of age or less). One dog, aged 9, showed chronic interstitial nephritis.

The lesions resemble those previously reported as "Kalkgicht" (calcium gout) and as "calcosinosis circumscripta", and the term "calcium gout" is considered a suitable one for designating the lesions, wherever they occur. The cause and pathogenesis of the lesions are still unknown.

Cox, G. W., Morgan, A. & Tayler, R. S. (1960). **Strontium-90 from fallout in the diet and milk of a dairy herd.**—J. Dairy Res. 27, 47-57. [Authors' summary modified.] 2321

Samples of forage and of the milk from a herd of cows were analysed regularly for ^{90}Sr and calcium. The 'observed ratio' (the ratio of Sr to Ca in the milk divided by the ratio of Sr. to Ca in the diet) was found to be 0.10 against Sr in favour of Ca, which corresponds well with results obtained by other workers. The amount of Sr secreted into the milk was 1.2% of the total ingested. Similar values were obtained using stable strontium data.

Soil samples from different depths and herbage were taken from three areas with different cultivation histories and analysed for radiostrontium and Ca. The effect of ploughing on the vertical distribution of Sr in soil and on amounts of Sr in vegetation was examined.

Purves, D. (1959). **Implications of restricting cows to a clover-free diet in order to reduce the strontium content of milk.**—Nature, Lond. 184, Suppl. No. 18 p. 1408. 2322

As clover is an important source of calcium in the diet of the dairy cow, especially during the summer, restriction of the intake of this forage to reduce the Sr^{90} in the milk could have serious effects on the cow. A table giving the strontium, calcium and magnesium contents of various common forage plants shows that any other plant that could increase the calcium and magnesium content of the diet would also increase the strontium content.

—E. J. CASTLE.

Rasmuson, B., Gahne, B. & Fredriksson, L. (1959). **Studies on the discrimination of Sr^{90} from diploid and tetraploid red clover and Ca^{45} in feeding experiments with mice.**—K. LandtbrHögsk. Ann. 25, 241-251. [In English.] 2323

Diploid and tetraploid red clover was grown in soil to which varying amounts of calcium carbonate had been added, with a constant addition of Sr^{90} . At all levels of Ca the diploid showed the greater uptake of Ca and Sr^{90} as percentage dry weight. Three groups of five 6-week-old mice were fed one of three diets, (1) a commercial ration, (2) and (3) synthetic diets containing 20% of the radioactive diploid or tetraploid clover respectively, and in which the Ca was almost entirely derived from the clover. A known amount of Ca^{45} was also added to the diet to enable the metabolism of the Ca and Sr to be compared. There was no significant difference in body-weight gains between the three groups or between the percentage excretion of daily intake of Sr and Ca. The percentage of Sr^{90} retained in the body tissue was a reflection of the Sr^{90} content of the diet. Mice discriminate against Sr in relation to Ca, the discrimination being more effective in the alimentary absorption than in the urinary excretion.—E. J. CASTLE.

Holmberg, B., Nelson, A. & Wallgren, E. (1960). **The transfer of strontium-90 from mother to fetus in mice.**—Radiation Res. 12, 167-172. [Authors' summary modified.] 2324

The ability of the foetus to take up strontium-90 appeared after the 14th day of gestation, and on the 19th day uptake continued for more than 4 hours after injection of the mother. In a third experiment it was demonstrated that Sr^{90} injected into the mother was available to the foetus in undiminished quantity for at least 4 weeks.

Steenberg, K. (1959). **Secretion of I^{131} from a dairy cow after an oral administration of a single dose in aqueous solution.**—Acta agric. scand., 9, 198-203. [In English.] 2325

A lactating cow weighing 400 kg. that received by mouth 700 microcuries of I^{131} excreted 2.73% of this dose in the milk during the next 9 milkings. The radioactivity was 1.93 microcuries per litre at the first milking and decreased rapidly in the next 4 days. The most important route of excretion was the urine.—M.G.G.

Garner, R. J. (1959). **Radiobiology: the metabolism of iodine and strontium in cows.**—Vet. Rec. 71, 982-989. Discussion: pp. 989-993. [Author's summary modified.] 2326

A proportion of ingested iodine-131, roughly 15-50%, depending upon the time of year, finds its way to the thyroid gland, whence it is released with a biological half-time of about 20 days. From 1.3-13.1% of a single oral dose of iodine-131 is eliminated in the milk in the seven days following administration.

Strontium behaves in a manner very similar to calcium, but the animal body can differentiate between the two elements. Discrimination occurs during intestinal absorption, urinary excretion and secretion into milk. Strontium is laid down in and resorbed from bone at a rate similar to calcium. From 0.17-3.9% of a single oral dose of strontium-89 is eliminated in the milk in the seven days following administration.

From the data available it can be concluded that, if a cow's milk is fit for human consumption, there is no danger to the cow itself from iodine-131 or strontium-90.

Dent, C. E. & Garretts, M. (1960). **Skin changes in hypocalcaemia.**—Lancet January 16th, 142-146. [Authors' summary modified.] 2327

In patients with three different diseases, severe skin changes were closely associated with temporary hypocalcaemia.

In each case dramatic improvement occurred, often repeatedly, when the plasma (or serum) calcium became normal or was restored to normal with vitamin D, parathyroid hormone, or calcium-gluconate injections.

This suggests a close association between "skin health" and plasma-calcium in certain patients. Since hypocalcaemia may not be clinically obvious this possibility should be borne in mind, especially as treatment is so satisfactory.

Hoe, C. M. (1960). **Tests for liver function in domestic animals.**—Vet. Rev. Annot. 6, 1-26. 2328

A review of the literature, with special reference to dogs.—R.M.

Spörri, H. & Schlatter, C. (1959). **Blutdruckerhöhungen im Lungenkreislauf. [Hypertension in the pulmonary circulation of horses and cattle.]**—Schweiz. Arch. Tierheilk. 101, 525-541. [Summaries in English, French and Italian.] 2329

A discussion on the diagnostic and prognostic value in various respiratory diseases of horses and cattle, of pulmonary hypertension due to increase in vascular resistance, resulting from reduction in the capillary surface and alveolar hyperventilation, produced by pneumonia and emphysema.—E.G.

Gorlin, R. J., Barron, C. N., Chaudhry, A. P. & Clark, J. J. (1959). **The oral and pharyngeal pathology of domestic animals. A study of 487 cases.**—Amer. J. vet. Res. 20, 1032-1061. 2330

The authors have surveyed lesions of the oral cavity, oral pharynx and peri-oral areas from 487 animals (377 dogs, 44 cattle, 35 cats, 17 horses, 9 mules, 3 sheep, a donkey, and a pig) for which histopathological material was available at the Registry of Veterinary Pathology of the Armed Forces Institute of Pathology, Washington, D.C. and the School of Veterinary Medicine, University of Minnesota. The different kinds of lesion are discussed from clinical, morbid anatomical and histopathological aspects, and there are 41 figures, mostly photomicrographs.

Among the 135 non-neoplastic lesions were: 54 of non-specific inflammation (many associated with terminal renal dysfunction in dogs), 22 of pyogenic granuloma, 13 of bovine actinomycosis and 7 of actinobacillosis, 2 of "eosinophilic granuloma" in cats, and one of trichinosis of the tongue of a dog.

Among the 170 benign neoplastic lesions were 96 of fibromatous periodontal epulis in dogs, 24 of canine oral papillomatosis, 15 of oral papillomas associated with bovine hyperkeratosis.

The 182 malignant tumours included: melanomas in 62 dogs, squamous-cell carcinomas in 35 dogs and 8 cats, and 10 mast-cell sarcomas in dogs.

Many important questions arising from this comparative study are posed. [See also V.B. 30, 1129].—E. COTCHIN.

Lopatkin, S. V. (1960). [Treatment of gastroenterocolitis in pigs by adding acetarsol to the feed.]—*Veterinariya*, Moscow 37, No. 1 pp. 45-46. [In Russian.] 2331

Gastroenterocolitis, a non-fatal illness of store pigs lasting 3-4 days is characterized by lack of appetite, vomiting, great thirst and diarrhoea and occurs mainly in winter. Bacteriological examinations were negative. Further cases were prevented by adding acetarsol (osarol) to the feed for 3-4 days after the first case occurred, at the rate of 0.4-0.6 g. a pig daily.—R.M.

I. Wilson, K., Zigas, V. & Gajdusek, D. C. (1959). New tremor syndromes occurring sporadically in natives of the Wabag-Laiagam-Kundep region of the Western Highlands of Australian New Guinea.—*Lancet*, October 31st, 699-702. 2332

II. Anon. (1959). *Kuru*.—*Ibid.* 719-720. 2333

I. 24 cases of tremor syndrome were described, representing several distinct disease entities. A few patients recovered spontaneously. Three cases clinically resembled

kuru observed in aborigines of the Eastern Highlands, although the two peoples are not known to be related.

II. The literature on this fatal neurological disorder of man is reviewed, and the similarity of the histological findings to those of scrapie in sheep is discussed. In *kuru*, the evidence indicates a genetic predisposition.

—M.G.G.

Butură, I., Bangău, S. & Sirbu, Z. (1959). Cercetări asupra nefritelor la bubelinele din Ardeal. [*Nephritis endemic in buffaloes in Transylvania*.]—*Lucr. Inst. Pat. Igiena anim.*, București 9, 285-295. [In Roumanian. Summaries in French and Russian.] 2334

Nephritis was diagnosed in 2-3% of buffaloes and lesions of hydronephrosis were found at slaughter in about 15% or exceptionally 50-60%. It occurred mainly in adults and was much commoner in females than in males. Diagnostic criteria were polyuria and albuminuria. No pathogenic bacteria were found associated with the disease.—R.M.

POISONS AND POISONING

Helwig, D. M. & Setchell, B. P. (1960). Observations on the diagnosis of nitrite poisoning in sheep.—*Aust. vet. J.* 36, 14-17. 2335

Because of the spontaneous formation of methaemoglobin from haemoglobin, blood methaemoglobin estimations are unsuitable for the routine diagnosis of nitrite poisoning, if there is a delay of hours in the specimens reaching the laboratory.

Using the diphenylamine blue test nitrite can be detected in blood smears and preserved serum at least one week after collection, and in specimens from carcasses up to 20 hours after death. The possible use of this test in the field and laboratory is discussed.—A. CULEY.

Grunert, R. R. (1960). Effect of alpha-lipoic acid on heavy-metal intoxication in mice and dogs.—*Arch. Biochem.* 86, 190-194. 2336

The selective toxicity of arsenicals for the pyruvic oxidase system has been attributed to their affinity for, and their inactivation of, the alpha-lipoic prosthetic group. The possibility that alpha-lipoic acid might counteract intoxication by arsenic and other heavy metals was investigated and the results were favourable.—R.M.

Gardiner, E. E., Andrews, F. N., Adams, R. L., Rogler, J. C. & Carrick, C. W. (1959). The effect of fluorine on the chicken proven-

tricus.—*Poult. Sci.* 38, 1423-1425. [Authors' summary modified.] 2337

A diet containing 0.08-0.1% F as sodium fluoride appeared to increase the size and weight of the proventriculus, compared with birds of the same age on normal diet. There was hypertrophy and hyperplasia of the columnar epithelium and thickening of the tunica propria of the proventriculus.—R.M.

Done, J., Mortimer, P. H. & Taylor, A. (1960). Some observations on field cases of facial eczema: liver pathology and determinations of serum bilirubin, cholesterol transaminase and alkaline phosphatase.—*Res. vet. Sci.* 1, 76-83. [Authors' summary.] 2338

The morbid anatomy, histo-pathology and chemical pathology of field cases of facial eczema are described.

The wide range in severity of disease within a flock is recorded.

Histological studies include those of vascular-occlusive lesions in the portal vein and hepatic artery. The significance of these lesions, which have not been described before, is discussed.

✓ I Percival, J. C. (1959). Photosensitivity diseases in New Zealand. XVII. The association

of *Sporidesmium bakeri* with facial eczema.

—N.Z. J. agric. Res. 2, 1041-1056. 2339

- II. Clare, N. T., Sandos, J. & Percival, J. C. (1959). Photosensitivity diseases in New Zealand. XVIII. The relationship between the beaker-test and facial-eczema toxicity.—Ibid. 1087-1095. 2340

- III. Clare, N. T. (1959). Photosensitivity diseases in New Zealand. XIX. The susceptibility of New Zealand white rabbits to facial-eczema liver damage.—Ibid. 1249-1256. [Author's summary modified.] 2341

I. Mycelium from a fungus subsequently identified as *Sporidesmium bakeri*, a species not previously detected in New Zealand, was observed on pasture. Facial eczema occurred in lambs grazing this pasture and in g.pigs fed dried grass from the area.

A spore sample from the same area comprised predominantly *S. bakeri* and gave a positive beaker test.

Cultures of the fungus when fed to g.pigs and lambs produced characteristic facial-eczema liver lesions as well as icterus and photosensitivity in the latter species. The toxin was detected in cultures which varied in incubation time and media. Mycelium as well as conidia were toxic.

II. The results confirm a frequent association between a positive beaker test and toxicity, but indicate that this association is not invariable. The test is in fact primarily an indicator of the presence of the fungus *Sporidesmium* rather than of facial-eczema toxicity. It provides a valuable research tool, but its use in field control measures is not recommended.

III. Rabbits fed on grass containing the facial-eczema hepatotoxin developed liver lesions similar to those seen in g.pigs and lambs, but oedema of the extrahepatic ducts was more frequently seen. Similar lesions were produced by feeding spores of *Sporidesmium bakeri* and ether extracts of toxic grass and of *S. bakeri* cultures. The rabbit appears more susceptible than the g.pig to the toxin.

Torlone, V. & Rampichini, L. (1959). Contributo allo studio delle malattie da fotosensibilità negli animali domestici. III. Rilievi morfologici, istochimici e comportamento delle mastzellen nella cute di ovini fotosensibilizzati con filloeritrina. [Photosensitization in domestic animals. III. Photosensitization of sheep by phylloerythrin.]—Arch. Vet. Ital. 10, 501-517. [Summaries in English,

French and German.] [For parts I and II see V.B. 29, 2964 & 3619.] 2342

In 6 lambs, aged 3 months, treated with phylloerythrin (1 mg./kg.) there was damage to the whole area of skin exposed to sunlight, with involvement of all the layers. The epidermis was least and the dermis (especially the deepest layer) most affected, with circulatory disturbances, degeneration and slight inflammatory infiltrations. Histochemical reactions in exposed areas did not differ greatly from those in protected areas. In affected areas there was more diffuse reactivity to periodic acid-Schiff stain and a diminution in chromotropic substance in degenerated connective tissue fibres. Counts of normal, agranular, vacuolated, ruptured and anuclear mast cells were similar in exposed and protected skin. It is concluded that histamine plays no part in the causation of lesions in photosensitization, because in nearly all animal species circulating histamine causes changes in the mast cells; in affected skin there is a drop in the histamine content without a corresponding increase in blood histamine; antihistamines do not prevent skin lesions of photosensitization.—T.E.G.R.

- Dodd, D. C. (1959). The pathology of facial eczema.—Proc. N. Z. Soc. Anim. Prod. 19, 48-52. [Author's summary.] 2343

Facial eczema is essentially an acute cholangitis which leads to obliteration of a variable number of intra-hepatic bile ducts. The sequel to obliteration is proliferation of portal bile ducts proximal to the lesion, portal fibrosis and gradual replacement of the liver cells as the portal lesion becomes more extensive. When large areas of the liver are affected in this manner, compensatory liver cell regeneration takes place in undamaged parts of the liver.

- Worker, N. A. (1960). Effect of injection of a hepatotoxin directly into the gall-bladder of rabbits.—Nature, Lond. 185, 785-786. 2344

Injection of ether extract of *Sporidesmium bakeri* into the gall-bladder of 20 rabbits caused very severe oedema and fibrosis throughout the biliary system and gross enlargement and discoloration of the liver. Twelve rabbits had clinical icterus. Rabbits inoculated in the duodenum or portal vein had only moderate liver damage. A retrograde movement of the toxin from the gall-bladder into the biliary tree is suggested.—M.G.G.

Thornton, R. H. & Ross, D. J. (1959). **The isolation and cultivation of some fungi from soils and pastures associated with facial eczema disease of sheep.**—N.Z. J. agric. Res. 2, 1002-1016. [Authors' summary modified.] 2345

Some fungi, isolated from soil and pasture grasses, have been examined in investigations relating to facial eczema disease of sheep.

Cultures were submitted to the "beaker test", which had frequently been found to give positive results with toxic grass. A positive test was given by a high-sporing strain of *Sporidesmium bakeri* isolated from pasture grass. Negative tests were given by the other species.

Eleven fungi (six species), including a strain of *S. bakeri*, were grown on modified Czapek-Dox and Raulin-Thom media and fed to g.pigs. Examination of livers revealed no lesions characteristic of the facial eczema toxin associated with grass. A high-sporing strain and two other strains of *S. bakeri* were later cultured, and the macerated fungal felts and culture fluids were used in animal feeding experiments. Some of these cultures produced in g.pigs symptoms associated with facial eczema disease.

Buck, W. B., Radeleff, R. D., Jackson, J. B., Claborn, H. V. & Ivey, M. C. (1959). **Oral toxicity studies with heptachlor and heptachlor epoxide in young calves.**—J. econ. Ent. 52, 1127-1129. [Authors' abstr. modified.] 2346

Oral toxicity studies using 13 dairy calves, 1 to 2 weeks old, showed that heptachlor epoxide was approx. 10 times as toxic as heptachlor. Both compounds were cumulative poisons. Heptachlor epoxide given to a dairy calf at 0.2 mg./kg. for 100 consecutive days had no harmful effects.

Johnsen, R. E., Dahm, P. A., Rusk, H. W., Fairchild, M. L. & Freeman, A. E. (1960). **Heptachlor residues on corn stover in relation to dairy cattle feeding.**—J. econ. Ent. 53, 19-22. [Authors' abstr. modified.] 2347

A field of maize was treated with a granulated formulation containing 5% of heptachlor (1 lb. heptachlor per acre), for control of European corn borers (*Pyrausta nubilalis*)

Maize samples were analysed for heptachlor and heptachlor epoxide at intervals after insecticide application. Holstein dairy cows were pastured in this field after harvest; no heptachlor epoxide was secreted in the milk.

Plapp, F. W., Jr., Bigley, W. S. & Darrow, D. I. (1960). **Studies on the metabolism and residues of P³²-labelled Delnav in a Hereford steer.**—J. econ. Ent. 53, 60-64. [Authors' abstr. modified.] 2348

Labelled Delnav was sprayed on a Hereford steer. Fatty tissues accumulated small amounts of the insecticide, but 7 days after treatment most of the dose was still on the hair. No residues were found in meat samples when the animal was killed a week later. metabolic degradation of the insecticide in mice was not affected by the route of administration.

Muth, O. H. (1960). **Carbon tetrachloride poisoning of ewes on low-selenium ration.**—Amer. J. vet. Res. 21, 86-87. [Author's summary modified.] 2349

Eleven ewes on a low selenium intake developed symptoms of poisoning and 1 died when 1 ml. of carbon tetrachloride was administered orally. The characteristic lesions of carbon tetrachloride poisoning, including hepatic centrilobular haemorrhagic necrosis, occurred in the ewe that died.

Nilsson, P. O. (1960). **Några fall av järnförgiftning med myokardshada hos smågrisar. [Acute iron poisoning with myocardial degeneration in piglets.]**—Nord. VetMed. 12, 113-119. [In Swedish. Summaries in English and German. English summary modified.] 2350

The paper describes the lesions in 10 piglets which died within 12 hours of receiving 1 to 2 ml. intramuscularly of an iron-carbohydrate complex. The myocardium had "tiger-stripes" of alternating pale and hyperaemic portions. Hydropericardium and hydrothorax were other common features. Microscopically, the myocardial lesion was a focal oedematous degeneration. Large amounts of glycogen were present in the degenerated muscle fibres. The iron had been phagocytized by the capillary endothelium in the heart, lungs, liver, and spleen. Since this form of iron therapy is commonly used without ill effects, it appears likely that some unknown factor was involved.

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

Baker, J. B. E. (1960). **The effects of drugs on the foetus.**—*Pharmacol. Rev.* 12, 37-90. 2351
A critical review of 354 publications.

—R.M.

Weiss, H. S. (1960). **Nicarbazin induced hypercholesterolemia in the hen.**—*Proc. Soc. exp. Biol., N.Y.* 103, 49-53. [Authors' summary modified.] 2352

Nicarbazin, when fed at 0.04% of a low-fat, low-cholesterol diet to laying hens, doubled plasma cholesterol within 2 weeks and tripled it within 4 weeks. Thereafter the hypercholesterolaemia was maintained at between 600 and 900 mg % for 32 weeks. The hypercholesterolaemia appears to result from continuous resorption of yolk from partially developed ova, while yolk material continues to be deposited in other ova just beginning the growth cycle.

Cover, M. S., Benton, W. J., Greene, L. M. & D'Armi, F. (1959). **Potentiality of tetracycline antibiotics with terephthalic acid and low dietary calcium.**—*Avian Diseases* 3, 353-361. 2353

Using infectious synovitis in chickens as an indicator of antibiotic activity it appeared that the use of either terephthalic acid or a diet low in calcium increased the amount of chlortetracycline or oxytetracycline in the serum, and allowed a twofold increase in clinical activity.—S. B. KENDALL.

See also *absts.* 2046 (penicillin prophylaxis in staphylococcal infections); 2047 (penicillin resistant staphylococci); 2064 (chemo-prophylaxis in TB.); 2100 (nitrofurantoin in *S. typhi-murium* infection in poultry); 2102-2104 (furazolidone in pullorum disease); 2228 (penicillin in blackleg); 2139 (relative antibacterial activity of three penicillins); 2153 (chlortetracycline for prevention of synovitis in fowls); 2158 ("ganaseg" (berenil) in *T. equinum* infection); 2166 (cocciidiostatic activity and toxicity of *ny-met*hamine and sulphonamides); 2223 (viricidal action of beta-propiolactone vapour); 2233-2244 (parasitocides); 2248-2252, 2256-2257 & 2262-2263 (anthelmintics); 2249 (carbon tetrachloride poisoning in sheep); 2427 (book, pharmacology).

Rasmussen, F. & Simesen, B. (1960). **Tracer dye green S in penicillin preparations for intramammary application.**—*Nord. VetMed.* 12, 120-132. [In English. Summaries in German and Danish. Authors' summary modified.] 2354

Green S (Colour Index No. 737) was added as a tracer dye to 6 different penicillin preparations for intramammary infusion. In a dose of 50 mg. per 100,000 i.u. penicillin it did not affect the antibiotic activity of the preparations after storage for 8 months at 5° C. and upon infusion it was non-irritant.

A direct relationship was demonstrated between the concentrations of penicillin and Green S in the milk from 6 normal cows infused. The colour intensity in milk containing more than 0.1 i.u. penicillin/ml. was so pronounced that a greenish-blue staining was directly visible. When the penicillin content was from 0.1 to 0.002 i.u./ml. the tracer was rapidly demonstrated by means of an ion exchanger.

Intramammary preparations containing aluminium monostearate were excreted in the milk partly in the form of particles containing penicillin and dye. The long period of excretion (up to the 39th milking) of this type of preparation is discussed with a view to preventing the occurrence of penicillin in market milk.

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

Alexander, G. & Brook, A. H. (1960). **Loss of heat by evaporation in young lambs.**—*Nature, Lond.* 185, 770-771. 2355

In 4 Merino lambs up to 15 days old, losses of water from the skin and respiratory tract were fairly constant at ambient temperatures of 10°-30° C., the cutaneous loss slightly exceeding the respiratory loss. Above 30°, the loss of water from both sources increased with rising ambient temp., particularly that from the respiratory tract, which at 45° was almost twice that from the skin. Heat production was lowest at about 30°. If evaporation from the skin was prevented, at an ambient temp. of 40-41°, the loss by respiration increased and

prevented a severe rise in rectal temp. But if the respiratory loss was reduced, evaporation from the skin did not increase much, and rectal temp. rose rapidly.—M.G.G.

Hafez, E. S. E., Ensminger, M. E. & Ham, W. E. (1959). **Morphological and physiological studies on dwarf Herefords.**—*J. agric. Sci.* 53, 339-346. 2356

Observations on 36 Hereford homozygous dwarf calves showed that 22 were "shorter dwarfs" with characteristic head abnormalities present at birth or later in life, 11 were atypical dwarf-like animals without the typical phenotypic expression of the snorter dwarf,

possibly the result of nutritional, endocrinological or pathological factors although modifying genes may also be involved, and three were "comprest" animals which did not exhibit snorter head abnormalities. They seemed to be the result of a single incompletely dominant gene. Most of the true dwarfs were chronic "bloaters" with pot shaped or normal belly. Of various body measurement indices, only the volume index (length of body divided by width of paunch) was greater in control animals than in typical dwarfs. Physico-chemically the only differences found were that the dwarfs had slower respiration rates and lower blood haemoglobin, haemocrit and white cell counts. Seven dwarfs died during the year, but the cause of death was different in each case. The heart was usually spheroid showing severe dilatation.—A. ACKROYD.

Surdan, C. (1959). Modificări histologice cadaverice ale rinichiului. [**Histological changes in pig kidney between 1 and 30 hours after death.**]—Lucr. Inst. Pat. Igiena anim., Bucureşti 9, 297-305. [In Roumanian. Summaries in French and Russian.] 2357

In carcasses kept at 20-23°C. degenerative changes in the convoluted tubules commenced 24-30 hours after death, giving the appearance of tubules obstructed by desquamated epithelial cells. The brush border of tubule cells was lost, and desquamation of epithelial cells began as early as 5 hours after death.—R.M.

Owen, E. C. (1959). **Biochemical aspects of diseases of livestock with particular reference to enzyme systems.**—Vet. Rec. 71, 1114-1123. Discussion: pp. 1123-1127. [Author's summary modified.] 2358

Elements formerly considered to be toxic hazards to farm animals continue to qualify as trace elements essential for animal life. A few years ago molybdenum qualified, and still more recently selenium. Molybdenum has turned out to be the "xanthine oxidase factor" needed by animals, and selenium has proved to be Factor 3 which is a partial substitute for vitamin E. In ruminants molybdenum shows interesting interactions with copper and with sulphate and it is antagonized in the lactating goat by tungstate. It is a constituent of xanthine oxidase which also contains iron and vitamin B₂ (riboflavin). Recent findings are described, including work of the author and his colleagues on the variations with species, of xanthine oxidase in milk. The key position of ruminants in the food chain supplying man

with Co as vitamin B₁₂ is discussed, and reasons advanced for the cow's and sheep's large requirements of Co compared with the small amount in the vitamin B₁₂ sufficing for man. Enzymic functions of vitamin B₁₂ are described. The effects of parasitism and of thyroxine in increasing B₁₂ requirements are also discussed. Recent discoveries of the function of selenium as a substitute for vitamin E in the rat, chicken and pig are discussed, and reference is also made to other metals implicated in the aetiology of disease of livestock.

Turner, A. W. & Hodgetts, V. E. (1959). **The dynamic red cell storage function of the spleen in sheep. I. Relationship to fluctuations of jugular haematocrit.**—Aust. J. exp. Biol. med. Sci. 37, 399-419. 2359

The jugular haematocrit increases when sheep are excited, exercised, or injected with adrenaline or noradrenaline; and decreases when they are anaesthetized with pentobarbitone, are kept experimentally under conditions which exclude external sensory stimuli, or are held with quiet restraint. Experiments with splenectomized sheep and with sheep which received infusions of ⁵¹Cr-labelled r.b.c. show that these fluctuations are caused by storage or extrusion of the r.b.c. by filling or contraction of the spleen. Up to one-seventh of the whole blood volume and one-fourth of the total r. b. c. volume can be stored in the spleen. Individual r. b. c. are stored as long as 30 min. or even longer in the spleen and subsequently become replaced by cells from the circulating blood. The plasma which becomes separated from the stored r. b. c. joins the bloodstream. This occurs mainly within the spleen.

—J. H. KOCH.

Braend, M. (1959). **Blood groups of cattle in Norway. Serological and genetical studies.**—Thesis, Oslo pp. 144. [In English.] 2360

Blood group studies were made on large numbers of Telemark and Døla cattle. Naturally-occurring anti-J isoantibodies were found in 56 of 770 cattle. Four new factors were detected and provisionally labelled N1, N3, N5 and B_o. 37 different B alleles were found in the Telemark breed and 60 in the Døla breed. —R.M.

May, N. D. S. (1960). **Absence of the prerenal segment of the posterior vena cava of the dog.**—Aust. vet. J. 36, 67-68. [Author's summary modified.] 2361

An unusual and interesting anomaly, found during dissection: the posterior vena

cava failed to reach the parietal surface of the liver. Instead the vessel joined the azygos vein on the thoracic side of the diaphragm.

Archer, R. K. (1960). **The biology of the eosinophil leucocyte.**—*Vet. Rec.* 72, 155-157 & 158. [Author's summary modified.] 2362

The author discussed briefly the structure, distribution, fate, and functions of eosinophile leucocytes. To explain the occurrence of eosinophilia or eosinopenia of circulating blood he suggested that the disposition of eosinophiles within the body may be dependent upon local histamine concentration, since eosinophiles are chemotactically responsive to histamine.

Webb, J. P. W., Allison, A. C. & James, A. T. (1960). **Lipid synthesis in fowl blood.**—*Biochem. J.* 74, No. 3 p. 30P of *Proceedings*. 2363

Fowl blood differs from human blood in its ability to synthesize a number of non-saponifiable sterols from acetate, and to incorporate fatty acids into cholesterol ester.

—R.M.

Brown, W. A. B., Christofferson, P. V., Massler, M. & Weiss, M. B. (1960). **Post-natal tooth development in cattle.**—*Amer. J. vet. Res.* 21, 7-34. [Authors' summary modified.] 2364

As a basis for future studies in tooth ring analysis (*i.e.*, the effects of specific physiological and pathological stresses on enamel and dentin formation), the chronology of development of the permanent incisor and canine teeth was established from analysis of radiographs from 869 purebred cattle living under optimal nutritional conditions. Development of the incisor and canine (anterior) teeth followed an orderly sequence. The first incisor began to develop enamel and dentin when the calf was 6 months of age; the second incisor at 12 months, when the crown of the first incisor was completed; and the third incisor at 20 months, soon after the crown of the second incisor was completed at 18 months. The canine tooth began its enamel and dentin formation at 27 months, three months after the third incisor crown was completed.

Eruption and root formation followed a similar orderly sequence from the first incisor to the canine tooth. The first incisor emerged into the oral cavity at 23 months, the second at 30 months, the third at 36 months and the canine teeth at 42 months. Root formation

was four-fifths completed at the time of emergence.

No significant breed or sex difference in chronology of tooth development was found, despite relatively large developmental and genetic differences between dairy and beef cattle.

Phillipson, A. T. (1959). **The rumen in relation to the animal.**—*Proc. Nutr. Soc.* 18, 131-134. 2365

The extent of digestion in the reticulum and rumen is considerable. Two workers using completely different techniques showed that 64 and 70% respectively of the dry matter in the reticulo-rumen of cattle and in the whole stomach of sheep disappeared. Estimations of short-chain fatty acids produced by rumen fermentation show that the quantity produced is sufficient to satisfy a large proportion of the energy requirement of the cow. Absorption from the omasum and abomasum is probably not very important. Little is known of the intestinal phase of digestion, but the ruminant is exceptionally good at conserving water and sodium, this being necessary because of the large amounts poured out in the digestive secretions.—E. J. CASTLE.

Balch, C. C. (1959). **Structure of the ruminant stomach and the movement of its contents.**—*Proc. Nutr. Soc.* 18, 97-102. 2366

B. gives a concise account of the structure and movements, as recorded by balloons, of the ruminant stomach. The way in which the digesta pass through the various compartments, the length of time spent in the rumen and factors influencing the rate of movement are discussed. Three figures illustrate the structure and the pressure changes in the ruminant stomach.—E. J. CASTLE.

Grosskopf, J. F. W. (1959). **Some factors affecting the secretion of abomasal juice in young dairy calves.**—*Onderstepoort J. vet. Res.* 28, 133-141. [Author's summary modified.] 2367

Methods are described for collection of abomasal secretion from calves and for its examination for proteolytic and rennin activity. The rennin and pepsin concentration of the secretion was studied during two different methods of feeding milk (nipple feeding and drinking from the open bucket). Both ways of feeding increased the rennin and pepsin concentration of the juice but the increase was greater in nipple-fed calves.

Administration of carbamylcholine stimu-

lated the abomasal secretion rate and also increased the rennin and pepsin content of the juice. Injection of atropine inhibited these functions.

During a period of 7 weeks the rennin concentration as well as the pH of the abomasal secretion of one calf fell steadily with increasing age.

Stevens, C. E., Sellers, A. F. & Spurriell, F. A. (1960). **Function of the bovine omasum in ingesta transfer.**—*Amer. J. Physiol.* **198**, 449-455. [Authors' summary modified.] **2368**

The omasal canal contracted with each primary and secondary contraction of the rumen. The contractions appeared to force the more fluid components of the ingesta from the canal to between the leaves of the body of the omasum. Canal contractions were often followed by contraction of the omasal body which forced accumulated fluid ingesta into the abomasum. Large volumes of ingesta sometimes flowed back from omasum to reticulum.

Hungate, R. E., Phillips, G. D., McGregor, A., Hungate, D. P. & Buechner, H. K. (1959). **Microbial fermentation in certain mammals.**—*Science* **130**, 1192-1194. **2369**

The contents of rumen, caecum and colon from camels, elephants, elands, gazelles and zebu cattle in Kenya were weighed and samples were taken for measurement of fermentation. 95-98% of the total fermentation in the alimentary canal occurred in the rumen, except in a male camel where 14% occurred in the large intestine. The fermentation rate per g. of contents was faster in small ruminants than in large ones. The commonest micro-organism was *Bacteroides succinogenes*; *Butyrivibrio* was also isolated.

—BRENDA M. WILSON.

Cheredkova, A. N. (1959). [Influence of sodium chloride solutions on gastric secretion in pigs.]—*Sborn. Rabot Leningrad. vet. Inst.* **19**, 188-194. [In Russian.] **2370**

Experiments on 4 pigs each having a gastric pouch and a gastric fistula revealed that 1% saline improved the function of the gastric glands but 3-4% solutions inhibited, while 5-6% solutions were irritant. After prolonged daily administration of 5-6% saline into the stomach, the glands appeared to become adapted and responded poorly or not at all to the irritation.—R.M.

Hiepe, T. (1959). Beitrag zur Gewinnung und Untersuchung des Liquor cerebrospinalis bei

gesunden Schafen unter praktisch-klinischen Aspekten. [Collection and examination of cerebrospinal fluid from healthy sheep.]—*Mh. VetMed. Suppl. No. 1* pp. 62-65. **2371**

Collection of cerebrospinal fluid by post-occipital and lumbar puncture in anaesthetized sheep was safe and simple. Liquor composition in 69 clinically healthy sheep is described.—E.G.

Tibbitts, F. D. & Hillemann, H. H. (1959). **Development and histology of the chinchilla placenta.**—*J. Morph.* **105**, 317-365. **2372**

A detailed account with 9 plates of illustrations.—R.M.

Zachariae, F. (1959). **Acid mucopolysaccharides in the female genital system and their role in the mechanism of ovulation.**—*Acta endocr., Copenhagen Suppl. No. 47* pp. 64. [In English. Summary in Danish.] **2373**

A thesis partly based on previously published work [*V.B.* **28**, 2668].—R.M.

Thoonen, J., van Spaendonck, L., Hoorens, J. & van Spaendonck, A. (1959). Onderzoek over de schildklierstuktuur bij mestvarkens. [Thyroid structure in fattened pigs.]—*Med. Veeartsenijsschool Ghent 3*, No. 2 pp. 42. [In Flemish. Summaries in English, French and German.] **2374**

Morphological and histological examination of thyroid glands from 105 slaughtered pigs indicated that while the ratio of follicle diameter to height of the epithelium was not related to sex or weight gain, it was related to carcass quality.—R.M.

Walker, D. G. (1960). **The transmission of sugars across the goat placenta.**—*Biochem. J.* **74**, 287-297. [Author's summary modified.] **2375**

The goat placenta has been shown to act in a similar manner to that of the sheep in that it is the site of formation of foetal-blood fructose from foetal-blood glucose. It is freely permeable to glucose, mannose, galactose and xylose but is impermeable to fructose, sucrose, maltose and lactose. Sorbose can traverse the placenta but only slowly.

The role of the remarkable relative impermeability of the placenta to fructose is discussed with reference to the occurrence of fructose in goat foetal blood and the mechanism of sugar transmission.

Tomoff, A. (1960). Über den Kupfergehalt der Leber unserer Haustiere. [Copper content of

the liver in domestic animals.]—Tierärztl. Umsch. 15, 96-97. 2376

The Cu content of a 100 g. sample of fresh liver from 902 animals slaughtered in Sofia was determined photometrically. It was 5.03 mg.% in cows and oxen (range of 2.7-9 mg.%), 6.92 in calves (3.4-10.4), 4.9 in adult buffaloes (1.7-8.1), 6.8 in buffalo calves (4.9-6), 6.48 in sheep (2.6-10.3), 7.64 in lambs (4.5-10.8), 5.65 in adult goats (2.7-8.6), 6.68 in goat kids (4.4-9), and 5.48 in pigs (2.6-8.4). In 4 bulls it was 9.25-11 mg.%. —M.G.G.

Shaw, K. E., Dutta, S. & Nichols, R. E. (1960). **Quantities of 17-hydroxycorticosteroids in the plasma of healthy cattle during various physiologic states.**—Amer. J. vet. Res. 21, 52-53. [Authors' summary modified.] 2377

451 determinations of 17-hydroxycorticosteroids were made on the plasma of 46

See also absts. 2428 (textbook of anatomy); 2429 (symposium on sex differentiation and development).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

Easterly, D. G., Demott, B. J. & Cragle, R. G. (1960). **Strontium in milk. I. Removal by means of reverse-flow ion exchange columns.**—J. Dairy Sci. 43, 137-145. 2379

Strontium 89 and calcium 45 were removed from the skim milk of orally-treated cows by means of an upward-flow exchange ion resin column. Dowex 50W-X12, Dowex 50W-X4 and Duolite C-20 were used, the calcium form being more effective than the sodium form. Duolite was not as effective as the other 2 resins for subsequent removals. Removal of isotopes added to skim milk followed a similar pattern.—T.E.G.R.

Vaughn, R. H., Ng, H., Stewart, G. F., Nagel, C. W. & Simpson, K. L. (1960). **Antibiotics in poultry meat preservation. Development in vitro of bacterial resistance to chlortetracycline.**—Appl. Microbiol. 8, 27-30. [Authors' summary modified.] 2380

Twenty-five cultures isolated from spoiled poultry meat were subjected to a training procedure by serial transfer into increasing concentrations of chlortetracycline (CTC). In general the level of resistance attained after a given number of transfers depended on the initial resistance of the culture. Several cultures resistant to at least 480 p.p.m. of CTC were obtained. Evidence is presented to show that the development of resistance to CTC is a step-like process.

cattle in various physiological states. With the exception of the values in heifers and cows in or near oestrus, no significant differences in plasma steroid levels were observed. No significant diurnal variations were detected in unmated heifers not in oestrus.

Self, H. L., Brown, R. R. & Price, J. M. (1960). **Quantitative studies on the metabolites of tryptophan in the urine of swine.**—J. Nutr. 70, 21-25. [Authors' summary modified.] 2378

Kynurenine, 3-hydroxykynurenine, kynurenic acid and xanthurenic acid, which had been found major urinary metabolites of tryptophan in man, the dog and the rat proved to be minor metabolites of the amino acid in swine. The growing pigs excreted large quantities of acetylkynurenine, *o*-aminohippuric acid, anthranilic acid glucuronide and an unknown diazotizable amine.

Coleby, B., Ingram, M. & Shepherd, H. J. (1960). **Treatment of meats with ionising radiations. III. Radiation pasteurisation of whole eviscerated chicken carcasses.**—J. Sci. Fd Agric. 11, 61-71. [Authors' abstr. modified.] 2381

Whole eviscerated chicken carcasses were irradiated with gamma-radiation from ⁶⁰Co, using varying doses up to 1 Mrad. When the meat was stored at 1°C., a dose of 0.8 Mrad (800,000 rads), gave a fivefold extension of the time required for putrefactive spoilage, and the flavour changes after such a dose were usually not noticed in roasted chickens. The quality of the irradiated carcasses tended to deteriorate during storage when stored for more than about one and a half times the period required for spoilage of untreated carcasses stored at 1°C. The deterioration is not due to oxidative rancidity of the lipids.

Van Dilla, M. A. (1960). **Zinc-65 and zirconium-95 in food.**—Science 131, 659-660. [Author's summary modified.] 2382

Zinc-65 has been found in small amounts in muscle and liver samples from cattle reared in Nevada, and also in commercial hamburger and beef liver from the southwestern area. Zirconium-95 and niobium-95 were found in the liver samples but not in the muscle. A trace of zinc-65 was detected in milk but none in human beings.

Kovalenko, Y. R. [Edited by.] (1959). [**Veterinary science in the U.S.S.R. forty years after the October revolution.**]—pp. 478. Moscow: Izdatel'stvo Ministerstva Sel'skogo Khozyaistva SSSR. [Trudy vsesoyuz. Inst. eksp. Vet. 23,] 16r. 50k. [In Russian.] 2383

Volume 23 of the Works of the All-Union Institute for Experimental Veterinary Medicine, Moscow, comprises 19 review articles on veterinary research in the Soviet Union during the past 40 years, and also briefer reports from 14 veterinary research institutes and 28 research stations. There is also a bibliography of 878 papers published by the All-Union Institute since 1923 and a list of dissertations. Protozoal diseases are dealt with by A. A.

Markov, foot and mouth disease by L. S. Ratner, brucellosis by E. S. Orlov, tuberculosis by V. S. Kiselev, chemotherapy by I. I. Kazanskii, disease of pigs by P. S. Solomkin and diseases of poultry by A. Y. Fomina.

—R.M.

See also absts. 2080 (listerialis, a public health danger); 2084 (survival of pasteurilla in fowl carcasses).

REPRODUCTION AND REPRODUCTIVE DISORDERS

Dun, R. B. (1959). **Artificial insemination in sheep.** I.—Aust. vet. J. 35, 529-531. 2385

To test the theory that heterospermic is better than homospermic insemination, three groups, each of 50 ewes, were inseminated from two rams: two groups were inseminated with the semen of one or other of the two rams and the other with mixed semen. Heterospermic insemination gave no observable advantage.—W. L. HINDMARSH.

Radford, H. M., Watson, R. H. & Wood, G. F. (1960). **A crayon and associated harness for the detection of mating under field conditions.**—Aust. vet. J. 36, 57-66. [Authors' summary modified.] 2386

The crayon is held on the brisket of the ram by the harness. In field tests the crayons continued to mark for at least two weeks and the marks were usually distinguishable for at least four weeks. The results were as good as or better than those obtained by applying raddle to the ram daily. The crayon material was readily scorable from the wool.

Hultnäs, C. A. (1959). **Studies on variation in mating behaviour and semen picture in young bulls of the Swedish Red-and-White breed and on causes of this variation.**—Thesis: Stockholm. pp. 82. [In English.] [Acta agric. scand. Suppl. No. 6.] 2387

Detailed observations were made on 2,101 bulls.—R.M.

Döcke, F. & Wiechert, W. (1959). **Spermakonservierung mit Hilfe von Säureanabiose. [Preservation of bull semen with citric acid.]**

Ressang, A. A., Fischer, H. & Muchlis, A. (1960). **The Indonesian veterinarian. His education, activities and problems.**—Commun. vet., Bogor 3, 55-99. [In English. Summary in Indonesian.] 2384

A survey of veterinary services and the main diseases and parasites of stock in Indonesia.—R.M.

—Zuchthyg. FortpflStörung. u. Besamung 3, 366-372. 2388

Samples of semen diluted with "Illini variable temperature" diluent were acidified drop by drop with 1.5 N citric acid solution to pH values of 6 to 6.5 and tested for motility survival both at 4° and 20°C. against similarly diluted semen routinely gassed with CO₂ and against egg yolk-citrate (E.Y.C.) diluent at pH 7.4. The results with citric acid were identical with those using CO₂, motilities up to 39% at the 8th day being obtained at 20°C. A first insemination trial gave identical conception rates of 60% for both gassed and citric-treated I.V.T. diluent after 2-3 days' storage as against 56% for E.Y.C. Both modifications gave 41% after 8 days. Both citric acidification and gassing to pH 6.3 of E.Y.C.-diluted semen gave 40% motility survival after 10 days at 4° but not at 20°C.; insemination trials with this citric-treated as against control E.Y.C. gave control conception rate 63% (90-120 day non-return), citric-treated 70%, both after 2-3 days at 4°C. The citric-treated diluent gave 61% after 5 and 52% after 8 days' storage.

—F. L. M. DAWSON.

Hancock, J. L. (1959). **Semen and testis characteristics and sexual behaviour of boars.**—J. agric. Sci. 53, 313-326. 2389

In 35 "first" ejaculates of semen from boars trained to mount a dummy sow and from boars at insemination centres, the mean spermatozoa concentration was 284.5 x 10⁶ per ml. whilst the mean total spermatozoa count

per ejaculate was 28.26×10^9 . The conc. of spermatozoa was usually greatest in the first 20–40 ml. of first ejaculates which had a mean volume of 173.7 ml. Values for "second" ejaculates were appreciably less. Motility of the spermatozoa was rapidly lost during examination under a cover-glass but could be restored by aeration, whilst the pH (mean value, 7.22) increased markedly when the semen was stored in open vessels but not in filled stoppered vessels. The methylene blue reaction time (mean 5.0 min.) was unaltered by killing the spermatozoa by freezing. Estimates of the percentage of dead spermatozoa in boar semen based on counts of eosinophile spermatozoa in smears stained with nigrosin-eosin appeared less reliable than with bull semen. The most frequent abnormal morphological characteristics of boar spermatozoa were middle piece beads and neck beads but the mean percentage of the former in vas deferens semen was 59.2 compared with 17.8 in ejaculate semen and of the latter, 17.4 compared with 11.8. Semen from sterile boars contained a higher percentage of malformed spermatozoa; evidence suggested that when the frequency of these malformations exceeds 26% and 21% respectively, the boar's fertility is impaired. Histologically many testes from fertile animals showed tubular atrophy associated with sperm impaction. No clear relationship was observed between the histological features of testes and semen characteristics and fertility.—A. ACKROYD.

Schmidt, K. & Bachnick, G. (1959). Versuche zur Eigewinnung bei der Sau. [*Collection of ova from sows.*]—Zuchthyg. FortpflStörung. u. Besamung 3, 361–365. 2390

16 sows were slaughtered 4, 3 or 2 days after onset of oestrus; ovaries were examined and oviducts flushed with normal saline. There were no tubal ova after 4 days but after 3 days, 39% of ovulated ova were recovered in this site from 7 of 9 sows; and after 2 days, 76% were recovered from all 6 sows. In a further 25 living sows, oviducts were flushed from the fimbrial end by means of median laparotomy using the technique of Hunter, Adams & Rowson (1955). The mean frequency of duration of oestrus as determined by a teaser boar for these sows was about 48 hours. Percentage recovery of ova in relation to the number of fresh corpora lutea, as compared with the beginning and end of oestrus, reached its maximum, 84%, when flushing

was carried out just as the sow ceased to stand for service.—F. L. M. DAWSON.

Velle, W. (1960). *Early pregnancy diagnosis in the sow.*—Vet. Rec. 72, 116–118. [Author's summary modified.] 2391

Having isolated oestrone from the urine of the pregnant sow, the author investigated the possibility of using quantitative oestrone determinations in urine for early pregnancy diagnosis in sows. A simplification of the technique for chemical determination of oestrogens in human urine was applied. Single urine specimens from 25 sows between 24 and 32 days pregnant, and 20 specimens from 15 non-pregnant sows were analysed. Two methods of hydrolysis were applied. Using 15 vol.% HCl and boiling of the samples for 1 hour under reflux, the difference between pregnant and non-pregnant animals was very striking (67 to 375 µg. oestrone per litre of urine for the pregnant animals against 1.8 to 20.5 µg. for the non-pregnant). It is concluded that the method gives reliable results and may be of importance in research on fertility problems in the pig.

Glover, F. A. (1960). *The response to ovarian hormone administration in the cow estimated from the physical properties of cervical secretions.*—J. Endocrin. 20, 56–64. [Author's summary modified.] 2392

Hexoestrol and progesterone were given to three ovariectomized cows and the consistency of mucus taken from the cervix uteri was measured. The amounts administered corresponding to the different phases of the reproductive cycle varied from 0.1 to 0.8 mg. per day for hexoestrol and 10–20 mg. for progesterone, rising to 70 mg. during attempts to simulate the last third of pregnancy. All hormones were given by daily subcutaneous injection. The 'oral/subcutaneous ratio' for hexoestrol, as judged by the consistency of cervical mucus, was found to be about 10.

During a separate experiment on intact heifers, it was observed that mucus much more like the normal type was produced by injections of oily solutions of hormones than by tablet implants or by injections of micro-crystals.

Zimbleman, R. G., Pope, A. L. & Casida, L. E. (1959). *Effect of exogenous progesterone on the corpus luteum of the bred ewe.*—J. Anim. Sci. 18, 1327–1332. 2393

Of the 51 ewes employed, 11 were killed 5 days after service, 20 at 13 days and 20 at

25 days: each of these 3 groups comprised control and test animals, the latter receiving 0.4 mg. progesterone daily in oil per lb. body weight [very heavy dosage]. The exogenous progesterone appeared to inhibit the growth of the corpus luteum, which at five days averaged 231 g. (controls 325 g.) and at 13 days 328 g. (controls 642 g.). However, conception rate was unaffected and pregnancy appeared equally well maintained as in controls [for up to a maximum of 11 days] on termination of a course of injections which inhibited corpus luteum growth. No regression was caused below the stage of development reached when injection began, (in contrast to results in the pig).—F. L. M. DAWSON.

Davies, H. L. (1960). **Reduced fertility associated with the use of multiple injections of progesterone followed by pregnant mare serum. II.**—Aust. vet. J. 36, 20-23. [Author's summary modified.] 2394

Oestrus was synchronized in 252 Merino ewes using the series of hormone injections described by Robinson [V.B. 26, 3308]. Of the progesterone/P.M.S. group of ewes 69% conceived in comparison with 87.5% in the control group. Following the P.M.S. injection 32% of ewes conceived to the first service. It is considered that there may be some mechanism following the progesterone injections which causes unsatisfactory conception.

McClure, T. J. (1960). **Use of chorionic gonadotropin to prevent early embryonic mortality in temporarily fasted mice.**—Nature, Lond. 185, 622. 2395

Mice were starved for 48 hours during early gestation and killed 3 or 6 days later. The embryos survived in most of the mice inoculated daily with 5 i.u. chorionic gonadotropin or 0.5 mg. progesterone during and also, in some, up to 5 days after starvation.

—M.G.G.

Williams, G. (1960). **Observations on the fertility of newly established herds.**—Vet. Rec. 72, 197-199 & 200. [Author's summary modified.] 2396

The 90- to 120-day non-return percentage rate for the 921 cows and heifers in 125 herds in the first year after being established was 60.8% compared with 73.7% for 5,310 cows and heifers in the other 664 herds in the same A.I. Sub-Centre area.

Similar observations in other parts of the country also show a lowered fertility in new herds. In progeny testing stations the fertility

of the heifers under test is much lower than would be expected for their herd mates at their home farms.

Factors associated with the change in environment are suggested as being responsible for at least some of this lowered fertility.

Kawata, K. & Koike, T. (1959). **Studies on the tubal patency of the cow. II. Tubo-insufflation test in clinical cases.**—Jap. J. vet. Res. 7, 149-155. [In English.] 2397

A simple "human" Rubin-type apparatus for air injection was employed; a manometer was incorporated but in the interpretation of the results, more importance was attached to feeling through the rectum the bubbling of air through a patent tube. Of 60 infertile cows 9 had bilateral and 6 unilateral oviduct block. Some of these latter results were considered due to spasm or temporary mucus accumulation since some such oviducts appeared patent when tested post-mortem. There was a suggestion that false results and uterine rupture (12 out of 60 cases) are more apt to occur in the period within 2 days of heat.

—F. L. M. DAWSON.

Scott, P. P. & Lloyd-Jacob, M. A. (1959). **Reduction in the anoestrus period of laboratory cats by increased illumination.**—Nature, Lond. 184, Suppl. No. 26, p. 2022. 2398

Ten cats aged 15-18 months were given additional illumination to 12 hours daily from 27th September to 15th March, by means of a fluorescent daylight lamp. 9 out of 10 exhibited oestrus in late November and early December and were successfully mated. 21 out of 22 controls did not show oestrus till early January.—F. L. M. DAWSON.

Velardo, J. T. (1960). **Induction of ovulation in immature hypophysectomized rats.**—Science 131, 357-359. [Author's abstr. modified.] 2399

Immature rats given minute doses of highly purified follicle-stimulating hormone and luteinizing hormone 7 to 100 days after hypophysectomy ovulated and formed corpora lutea. Neither hormone alone was effective. LH repaired in part the atrophied theca interna and interstitial tissue, and FSH stimulated the development of the granulosa cells.

Dziuk, P. (1960). **Frequency of spontaneous fragmentation of ova in unbred gilts.**—Proc. Soc. exp. Biol., N.Y. 103, 91-92. [Author's summary modified.] 2400

Unfertilized ova were recovered from the reproductive tracts of 31 gilts, 2-10 days after

oestrus. Examination revealed that 80% of ova recovered from uterine horns were fragmented. The proportion of fragmented ova increased directly with post-ovulatory age.

Hurst, V. (1959). *Studies of anestrus in dairy cattle.*—J. Amer. vet. med. Ass. 135, 471-475. 2401

When examined for pregnancy at 2 months (heifers) or 3 months (cows), 19% of 249 heifers and 8% of 380 cows not seen to return were not in calf (in 57 and 59% respectively of these a corpus luteum was present). 14% of 567 cows had not shown heat by 70 days post-partum but by 90 days this fell to only 5%. In 16 cows, ovaries were palpated twice weekly from 21–60 days post-partum. All three of those not exhibiting heat during this period had ovulated silently but in one there was a quiescent period of 29 days associated with a retained corpus luteum.

—F. L. M. DAWSON.

I. McLean, J. W. & Claxton, J. H. (1959). *Vaginal prolapse in ewes. Part V: Seasonal variation in incidence.*—N.Z. vet. J. 7, 134-136. 2402

II. McLean, J. W. (1959). *Vaginal prolapse in ewes. Part VI. Mortality rate in ewes and lambs.*—Ibid. 137-139. [Authors' summaries modified.] 2403

I. Field survey data on vaginal prolapse covering four seasons, and about 317,000 breeding ewes on 296 farms in the South Island of New Zealand, indicated that the overall annual incidence rarely exceeded 0.6%. 80–90% of cases occurred before lambing. Of those occurring after lambing, about two-thirds were recurrences of pre-lambing cases.

On 64 farms surveyed in each of two seasons, seasonal variation in average annual incidence of 80% was observed, with still greater variation within districts. The incidence on hilly country was much higher than on flat country, and in some cases where the incidence was high this difference was accentuated.

Correlation of incidence between seasons indicated that on flat country cases occurred wholly at random, whereas on hilly country a "farm" factor was also involved.

II. With treatment, which is administered mainly by the farmer himself, about 60% of ewes with prolapse recover, 27% die, and 13% are destroyed as "incurable". Of those that recover sufficiently to reach parturition, one-third of both single and multiple

pregnancy-cases produce stillborn lambs. In 55% of twin pregnancies, both lambs are born alive, while in 11% one lamb only is born alive.

I. Short, R. V. (1959). *Enucleation of the bovine corpus luteum.*—Vet. Rec. 71, 917-918. 2404

II. Dawson, F. L. M. (1959). *Enucleation of the bovine corpus luteum.*—Ibid. 918-919. 2405

III. Rowson, L. E. (1959). *Enucleation of the bovine corpus luteum.*—Ibid. 919. 2406

I. The conflicting reports about the maintenance or otherwise of pregnancy in the cow following removal of the corpus luteum in the second half of pregnancy may be explained by assuming that when maintenance occurs, there is some extra-ovarian source of progesterone present as is believed to be the case in women, horses, sheep, dogs and cats. The most likely sources are the placenta or the maternal adrenal glands. The rate of progesterone production in the cow throughout pregnancy is probably in the region of 36 mg. per 24 hours.

II. Reports have indicated that the weight of the bovine corpus luteum and its progesterone content decrease in the second half of pregnancy and that a lower proportion of heifers abort as the time chosen to express the corpus luteum advances towards term. Whilst reappearance of the corpus may sometimes occur, pregnancies have been observed to be unaffected by corpus expulsion as early as the 3rd month and no sign of regenerate corpus was present P.M. As the progesterone level in blood remains constant throughout pregnancy, the hormone must, in the later stages, be produced elsewhere in the body.

III. Enucleation of the bovine corpus luteum in the first 3 months of pregnancy has, in the author's experience, invariably resulted in abortion. If it does not, there is either some residual tissue left behind or a second corpus luteum is present in the other ovary. Experiments in sheep have shown that the ovaries are not only unnecessary for the maintenance of pregnancy from the 60th day onwards but are also inessential for the induction of parturition and subsequent lactation.

—A. ACKROYD.

Kawata, K., Watanabe, M., Kumagai, Y., Yamada, M., Tsuge, K., Moriya, M. & Iwanaka, H. (1959). *Application de l'utérase au traitement de la rétention du délivre chez la vache. [Proteolytic enzymes for treatment*

of retained placenta in cows.]—Jap. J. vet. Res. 7, 119-125. [In French.] 2407

14 cows were treated, all except 2 of which had retained the placenta for 2-7 days after calving. Spontaneous expulsion resulted in 13 and the remaining case responded readily to manual traction. All 9 that were recorded as subsequently inseminated, eventually conceived (mean 2.2 inseminations). In 10 cases local antibiotics were applied as adjuvant treatment. Dose of enzyme varied, usually 450-1000 mg. in 100 ml. diluent, but 2 cases received more. Little detail is given of the proprietary enzyme preparation used.

—F. L. M. DAWSON.

Foote, W. D., Zimbelman, R. G., Loy, R. G. & Casida, L. E. (1959). **Endocrine activity of corpora lutea from first-service and repeat-breeder dairy heifers.**—J. Dairy Sci. 42, 1944-1948. 2408

7 repeat breeder (4 vain services) and 7 first-service heifers each yielded 2 consecutive corpora lutea, the first being removed through an incision in the dorsal fornix and the second at slaughter. Corpora were weighed, analysed for luteal cell content and assayed for progesterone concentration. First corpora lutea from first-service heifers averaged 4.76 g. and from repeat breeder heifers 3.89 g., a significant difference; progesterone concentration and cell content did not differ between the groups. For second corpora lutea the weight difference was less marked, bodies from first-service heifers being relatively smaller. Progesterone concentration was unchanged and the total content therefore less in this group. In the repeat breeder heifers the progesterone concentration and total content were raised from 33 to 40 μ g. per g. and from 138 to 149 μ g. respectively. [The authors do not comment on this difference which could be interpreted as a therapeutic effect.] It is claimed from statistical analysis of the results, considering first and second corpora together, that no evidence is provided of progesterone deficiency at 14 days. [But very possibly second corpora lutea of first-service heifers are not admissible in this connexion; their reduced size may well be a result of the interference.]

—F. L. M. DAWSON.

Bratton, R. W., Musgrave, S. D., Dunn, H. O. & Foote, R. H. (1959). **Causes and prevention of reproductive failures in dairy cattle. II. Influence of underfeeding and overfeeding from birth to 80 weeks of age on growth, sexual development, and semen**

production of Holstein bulls.—Bull. Cornell agric. Exp. Sta. No. 940 pp. 45. 2409

After maintenance at high, medium and low feeding levels, 4 Friesian bulls on each were slaughtered, at 0, 16, 32, 48, 64, and 80 weeks of age. Although on the high level bulls started semen production at 37 weeks and on the low level not until 51 weeks, the feed cost to semen production age averaged \$164 for high and only \$60 for low level bulls. On the low level there was no damage to the sperm-producing tissue.—F. L. M. DAWSON.

Janzen, G. (1959). **Erfahrungen mit der Aström'schen Methode bei der Sterilitätsbehandlung im Rahmen der Besamung. [Treatment of sterile cows by Aström's method.]**—Tierärztl. Umsch. 14, 383-385. 2410

Aström infused very dilute Lugol's soln. into the uterus 2-4 days after service. J. adapted this method by infusing 100-150 ml. of a soln. of the sulphone "Lotagen" into 415 infertile cows 24-48 hours after insemination and 73.5% became pregnant.—R.M.

Moller, K. (1959). **Effect of calciferol injections on bovine fertility. 2.**—N.Z. vet. J. 7, 126-128. 2411

1,545 cows were treated and 1,571, matched for age, yield and calving time, left as controls. 32 normal herds and 7 with herd breeding problems were involved. Each treated cow received 3 million units of calciferol oil subcutaneously, 6-10 weeks before commencement of the serving season.

Results differed widely as between herds, but overall differed in favour of the controls by 2.6% in conception rate to first service, in cows served more than 60 days post-partum, and by 4.2% in cows served earlier. 7 problem herds, free from the usual genital infections, showed an increased difference in conception rate, about 6% in favour of the treated animals.—F. L. M. DAWSON.

I. Ogden, A. L. (1959). **Discussion on inherited metabolic characters in man and animals. Biochemical polymorphism in farm animals.**—Proc. R. Soc. Med. 52, 955-959. 2412

II. Rimington, C. (1959). **Discussion on inherited metabolic characters in man and animals. Congenital porphyria in animals.**—Ibid. 963-964. 2413

I. A general review of recent work with reference to electrophoretically distinct haemoglobins in ruminants, beta-lactoglobulins in cow's milk and serum protein polymorphism in farm animals.

II. A concise summary of the occurrence of congenital porphyria in cattle and the evidence that it is transmitted as a Mendelian recessive character, and in pigs where it appears to be inherited as a single dominant gene or some more complicated mechanism.

—W. E. PARISH.

Weber, W. (1960). Blinde Kälber bei einer schweizerischen Rinderrasse. [**Hereditary**

congenital blindness in calves of a Swiss breed.]—Schweiz. Arch. Tierheilk. 102, 15-18. [Summaries in English, French and Italian.] 2414

Between 1956 and 1959 bilateral corneal opacity affected 25 calves of both sexes. [The name of the breed and the total number of calves born during this period are not stated.]

—E.G.

See also absts. 2054 (bovine granular vaginitis); 2096 (breeding hygiene in sheep); 2101 (exp. cloacal infection of pullets with semen from cocks with pullorum disease); 2106-2122 (brucellosis); 2125-2126 (leptospirosis in pregnancy); 2137 (differential diagnosis of pyometra and endometritis in the bitch); 2169 (toxoplasma abortion in ewes); 2221 (Q fever antibodies in aborting cattle); 2324 (transfer of strontium-90 from mother to fetus in mice); 2372 (study of chinchilla placentae); 2373 (ovulation); 2375 (transmission of sugar across placenta).

ZOOTECHNY

Callow, E. H. & Finney, D. J. (1959). **Some effects of implanted hexoestrol on the growth of steers.**—J. agric. Sci. 53, 404-411. [Authors' summary modified.] 2415

The effects of 15, 30 and 60 mg. of hexoestrol (ear implants) on growth (over a period of 95 to 98 days) were studied in Argentina, using Hereford steers 4-5 years old.

On pasture where growth rate was only about 0.4 kg. a day, the optimum dose was 30 mg., which gave an extra 0.14 kg. per day.

The carcasses from the 30 mg. group were heavier by 8 kg., those from the 15 mg. group by 7 kg., but those from the 60 mg. group were only 3 kg. heavier than from controls.

The carcasses of the 60 mg. treated animals were significantly leaner than the controls; the grading was poorer, the excess kidney fat less, and the subcutaneous fat thinner.

The incidence of 'tail raising' had been increased from 10% in the control group, to 50% and more in the treated groups. Carcasses from such animals were slightly wider at the thigh.

Evidence was obtained of a rapid loss in live weight when the steers were without food. During a single morning this averaged about 13 kg. per animal, followed by a further 25 kg. during the subsequent 24 hours.

Bridger, G. A. (1959). **Sheep production in Southern Rhodesia.**—Rhod. agric. J. 56, 211-217. 2416

Figures were given for sheep population, sheep losses, and consumption of mutton during the period 1920-1957. In 1957 there were 248,000 sheep in Southern Rhodesia. In 1956 12,000 were lost from the following

causes:—disease (57%), poverty and old age (8.5%), accident, wild animals and poison (28%), lost or stolen (6.6%).—R.M.

Ward, H. K. (1959). **Some observations on the indigenous ewe.**—Rhod. agric. J. 56, 218-223. 2417

W. gave data for breeding season, age at first lambing, multiple births, longevity, birth weight of lambs and rate of growth of the breed indigenous in Southern Rhodesia. There was no well-defined lambing season, but 60% of lambs were born between April and August. About 18% of lambs died during the first 4 months of life. Losses of lambs born between May and October were double those of lambs born between November and April.—R.M.

Buechner, H. K., Harthoorn, A. M. & Lock, J. A. (1960). **Control of African wild animals.**—Nature, Lond. 185, 47-48. 2418

The development of the gas gun has developed hopes that it may be possible to inject drugs from a distance into wild animals for the purpose of immobilization for study or for transport to other areas. The drug initially used, nicotine, proved irregular in action and had other disadvantages. The authors have now experimented with succinylcholine chloride in Uganda and Kenya. The drug was used as an immobilizing agent in Kenya kob, black rhinoceros and Rothschild giraffe. After capture a tranquillizing drug is given before the effects of the first drug have worn off. Transport of the animal can then be effected. The drug also proved effective in zebra and Lelwel's hartebeest.

These experiments are of importance in developing means of controlling and conserving vanishing wild life.—R. N. FIENNES.

Anon. (1959). **Machine milking.**—Bull. Minist. Agric., Lond. No. 177 pp. 195. London: H.M. Stat. Off. 12s. 6d. 2419

After a brief account of the anatomy and physiology of the udder, each component of the various kinds of milking machine is described and the mechanical principles involved in its operation discussed. A chapter on the use of the milking machine is concerned with those factors of design which influence milking efficiency and with the efficient planning of work in both cowshed and milking parlour; a system is described for choosing the type and size of installation required according to the number of cows, average daily yield and the time and labour available. The chapter on milking machines and mastitis consists of an extensive and detailed review of the literature together with several references to unpub-

lished work on teat and teat sphincter infection, teat sphincter erosion, the effect of the absence of pulsation and differences in the pathogenicity of different strains of bacteria. The bulletin concludes with short chapters on the cleaning and sterilization of milking machines and the properties of rubber.

—IAN DAVIDSON.

Bratlie, P., Slagsvold, P. & Tollersrud, S. (1959). Pulseringshastigheten ved maskinmølking. En orienterende undersøkelse. [**Significance of pulsation rate in machine milking.**]—Nord. VetMed. 11, 759-779. [In Norwegian. Summaries in English and German.] 2420

Experiments lasting 15 weeks on 16 cows showed that a pulsation rate of 40 a minute gave better results and caused less teat injury than a rate of 60 or 75 a minute.—R.M.

TECHNIQUE AND APPARATUS

Serfontein, W. J. & Weyland, H. (1959). **A laboratory scale apparatus for the continuous culture of micro-organisms with automatic pH control.**—Onderstepoort J. vet. Res. 28, 39-45. 2421

The authors give technical details of their modification of the "chemostat" for the continuous culture of micro-organisms. Apparatus incorporates an automatic pH control and has given satisfactory results for runs lasting several weeks.—W. J. BRINLEY MORGAN.

Weyland, H. & Serfontein, W. J. (1960). **An apparatus for continuous cultivation of micro-organisms with independent control of limiting growth factor and/or other metabolites.**—Zbl. Bakt. I. (Orig.) 177, 264-271. [In English. Summaries in French, German, Spanish and Russian. English summary modified.] 2422

An apparatus for the continuous cultivation of micro-organisms with provision for

separate control of the rates at which several metabolite solutions are added is described. This apparatus enables the experimenter to achieve variations in cell concentration, in the concentration of special metabolites and in growth rate independently of one another during a single continuous run. The advantages of such a system are described.

Gilbert, Y. (1959). Réflexions sur la lyophilisation des produits biologiques sous conditions tropicales. [**Freeze-drying biological products under tropical conditions.**]—Bull. Acad. vét. Fr. 32, 481-491. 2423

Personal experiences in freeze-drying of biological products (particularly rinderpest vaccine) under tropical conditions are recorded. The difficulties encountered, and the solution thereof, are discussed and the advantages of this method of preserving vaccines are presented.—T.E.G.R.

See also abst. 2431 (recent research on freezing and drying).

BOOK REVIEWS

van Goidsenhoven, C. & Schoenaers, F. (1960). **Maladies infectieuses des animaux domestiques.** [**Infectious diseases of domestic animals.**] pp. 852. Paris: Vigot Frères. Liège: Desoer. 2424

This book, of which the authors are professors at the Brussels School of Veterinary Medicine, describes in a concise, clear and readable style the bacterial and virus diseases

of domestic animals throughout the world. A chapter is devoted to each disease, with sections on aetiology, susceptible species, symptoms, pathogenesis, diagnosis, pathology, treatment and prevention. Most chapters have a short bibliography, but in a few this has been omitted, although workers who have studied the disease are mentioned by name in the text. Oedema disease of swine, African horsesick-

ness, bluetongue and virus abortion of sheep are not described. The index is rather inadequate, since it lists merely the chapter headings and a few of the important synonyms of the diseases. It does not refer to causal agents, and mastitis, which is not given a separate chapter, is not mentioned. The book is well printed.—M.G.G.

Dalrymple-Champneys, W. (1960). **Brucella infection and undulant fever in man**, pp. xii + 196. London (New York & Toronto): Oxford University Press. 25s. 2425

This book is based essentially on some 1,500 cases of human brucellosis investigated by the author, and includes well written chapters on clinical features, diagnosis, treatment etc.

However, since human brucellosis is essentially a disease transmitted directly or indirectly from animals to man (spread from man to man is very rare) much attention is paid in this book to animal brucellosis. The chapter on "Prevention" in particular is a challenge to the veterinary profession. To quote the author: "The most important preventive measure is, of course, the elimination of the animal reservoirs of infection. In Gt. Britain, this means the eradication of contagious abortion of cattle". Although the incidence of abortion in cattle due to brucella has decreased in this country, the incidence of brucella-infected milk has not decreased to the same extent. Pending eradication, the author strongly recommends the compulsory pasteurization of milk since it is the commonest source of human infection. In view of the nature of the disease in man this is wise counsel.

The material is well presented and valuable and includes nearly 400 references.

—W. J. BRINLEY MORGAN.

Anon. (1960). Bericht des 3. Kongresses der Deutschen Veterinärmedizinischen Gesellschaft. Bad Nauheim 18/19. April 1959. [Report of the 3rd Congress of the German Veterinary Medical Association, Bad Nauheim April 1959.] pp. 135. Berlin (& Hamburg): Paul Parey. DM. 28.60 2426

The proceedings of this Congress form the March issue of *Zentralblatt für Veterinärmedizin*, but they are also available in booklet form in the same style as the reports of the first and second conferences. There are 23 papers. The main themes are clinical diagnostic methods and diseases of poultry.—R.M.

Lewis, J. J. (1960). **An introduction to pharmacology**, pp. xii + 826. Edinburgh (& London): E. & S. Livingstone Ltd. 55s. 2427

This book is intended for students of experimental pharmacology and for bridging the gap between pre-clinical and clinical studies of medical and veterinary students. It will serve as a more detailed companion to Alexander's "Introduction to veterinary pharmacology". It deals strictly with classification and mode of action of drugs, with particular attention to the effect of chemical structure on drug action, and is thoroughly up-to-date. There is an unusually detailed index covering 79 pages.

The author, who is Senior Lecturer in Experimental Pharmacology at the University of Glasgow, has discovered how to present pharmacology in a way that will hold the reader's attention.—R.M.

Nickel, R., Schummer, A. & Seiferle, E. (1960). *Lehrbuch der Anatomie der Haustiere*, Band II. Eingeweide. [Textbook of anatomy of the domestic animals. Volume 2. Viscera.] pp. xiii + 411. Berlin (& Hamburg): Paul Parey. DM 98. 2428

This second volume concerns the alimentary, respiratory, excretory, and reproductive systems. Each is dealt with in a comparative chapter and details of the structures in each of the domestic mammals then follow. Not only is the morphology described, but also the functional anatomy of the parts is stressed. The illustrations are superb; although several have been seen in other German text-books very many new ones appear among the 559 figures. The language barrier will, of course, lessen the value of this work to those without a knowledge of German, and the high cost may deter others. Nevertheless, it will be a very poor (in outlook as well as funds) department of veterinary anatomy, human anatomy, or zoology that does not have this book available.—R. N. SMITH.

Austin, C. R. [Edited by.] (1960). **Sex differentiation and development. Proceedings of a Symposium held at the Royal Society of Medicine, Wimpole Street, London, on 10 and 11 April 1958**, pp. x + 198. Cambridge: University Press. [Memoirs of the Society for Endocrinology No. 7.] 45s. 2429

The list of participants in this symposium includes 38 names, including that of a single veterinary surgeon and those of six overseas visitors. In addition to an introduction and conclusion by the chairman Dr. Parkes and Professor Amoroso, the book contains 16

papers on a wide range of subjects including sexuality in bacteria and sex differentiation in arthropods. The papers on mammals with one exception are either general and theoretical largely based on work with small laboratory rodents, or deal with aspects involving human medicine. The exception is a group contribution by four different workers on the possibility of controlling sex ratio at conception, and forms the main item of direct veterinary interest in the book. M. J. Gordon's work (U.S.A.), and that of V. N. Schröder (U.S.S.R) based on the rabbit, is discussed in considerable detail, and the limitations and possibilities of their electrophoresis techniques competently analysed. K. G. McWhirter analysed the sex ratio performance of 32 A.I. bulls and found highly significant individual differences, while 5 bulls changed their performances significantly from year to year: in Muridae he reported evidence of a connexion between sex ratio performance and blood serum pH. R. A. Beatty (Edinburgh) discusses some preliminary results on possible size differences between X and Y forms obtained with bull and boar spermatozoa. A. Walton in the discussion mentioned that the Russians had failed in their attempts to apply Schröder's results to practical agriculture. P. E. Lindahl's results with a counter-streaming centrifugation method on bull semen, receive a total notice of four lines in a paper of 35 quarto pages, despite the practical promise of the work and interest of the results to date. Centrifugation has also been used by J. E. Lovelock, again with rabbit material, but he obtained only equivocal results. The paper on sex chromatin omits mention of the successful application of this method of foetal sex diagnosis in cattle by Møller & Neimann Sorensen (1957). In a later chapter R. P. Michael reports some interesting results on reproductive physiology in the female cat. The able work on ovarian homografts in mice, rats and hamsters reported by Parrott and Parkes could ultimately have important applications to domestic animals if the practical difficulties were overcome. There is a special index to animal species as well as a full general index: the photographic illustrations, includ-

ing several in colour, are very good and clear. There are a few printer's errors.

—F. L. M. DAWSON.

Parkes, A. S. & Smith, A. U. [Edited by.] (1960). **Recent research in freezing and drying**. pp. vii + 320. Oxford: Blackwell Scientific Publications. 63s. 2430

This book contains the proceedings of the Second International Symposium on Freeze-Drying held in London in 1958. The 21 papers are divided into five groups under the titles biophysics of freezing; freezing of living organisms; biophysics of freeze-drying; applications of freeze-drying to micro-organisms; freeze-drying of mammalian tissues. Two articles are of special veterinary interest: protective action of neutral solutes during the freezing of bull spermatozoa and trypanosomes by C. Polge and M. A. Soltys; dried virus vaccines against rinderpest, by G. R. Scott and C. S. Rampton.—R.M.

Francis, G. E., Mulligan, W. & Wormall, A. (1959). **Isotopic tracers. A theoretical and practical manual for biological students and research workers**. pp. xx + 524. University of London: The Athlone Press. 2nd Edit. 52s. 6d. 2431

Hevesy, the pioneer of the use of isotopic tracers in biology and author of the first text on the subject, predicted in the foreword to the first edition of this work that this second edition would follow. The subject is expanding rapidly and this volume brings the contents up to date and maintains the good standard of the earlier edition.

The newer parts include details of important techniques such as tritium labelling and liquid scintillation counting. The chapter on hazards and precautions is thoroughly revised and a new chapter dealing with the use of tracers in kinetic studies of biological processes is very valuable, especially for readers whose mathematics is not strong. The number of good texts dealing with this general field is steadily increasing. This volume is well able to hold its own in this company. It approaches the topic in an essentially practical way which will appeal to many users.—M. K. LLOYD.

BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review]

- Croft, P. G. (1960). **An introduction to the anaesthesia of laboratory animals.** pp. 31. London: Universities Federation for Animal Welfare. 3s. 6d.
- Lerche, M., Bartels, H., & Kelch, F. (Edited by) (1960). A. Schroeter/M. Hellich. Das Fleischbeschaugesetz nebst zusätzlichen Verordnungen und Gesetzen, mit Erläuterungen. Teil 1. [**Meat inspection law, with explanations, Part 1.**] pp. viii+218. Berlin (& Hamburg): Paul Parey. 7th Edit. DM 22.
- Malies, H. M. (1959). **Applied microscopy and photomicrography.** pp. 143. London: Fountain Press. 22s. 6d.
- Pattison, F. L. M. (1959). **Toxic aliphatic fluorine compounds.** pp. xi+227. Amsterdam (London, New York & Princeton): Elsevier Publishing Company. 18s.
- Riley, J. F. (1959). **The mast cells.** pp. x+182. Edinburgh (& London): E. & S. Livingstone Ltd. 30s.
- Ruch, T. C. (1959). **Diseases of laboratory primates.** pp. xxvi+600. Philadelphia (& London): W.B. Saunders Co. 52s. 6d.



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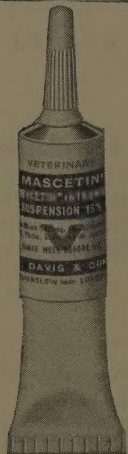
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